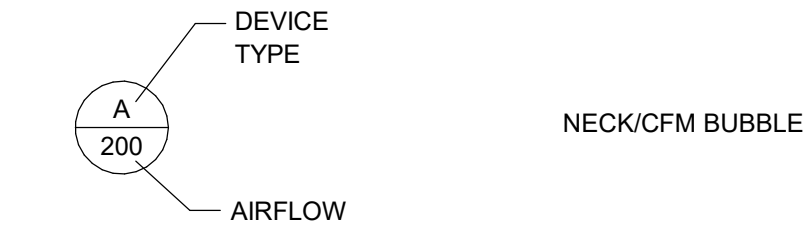
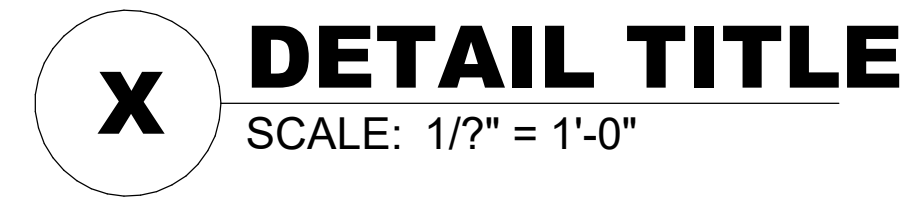


MECHANICAL SYMBOLS ABBREVIATIONS

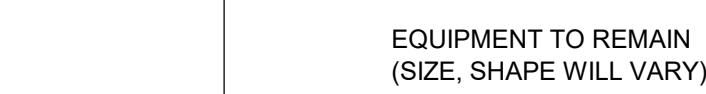
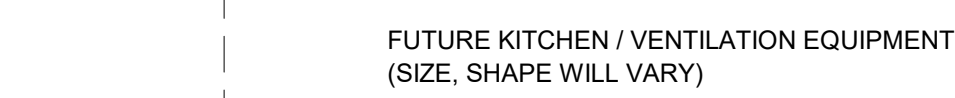
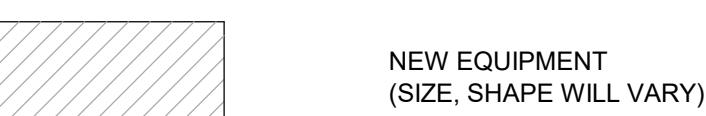
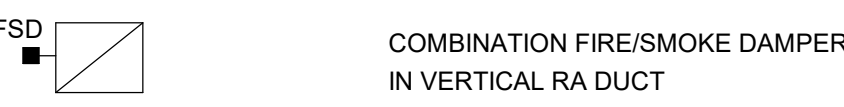
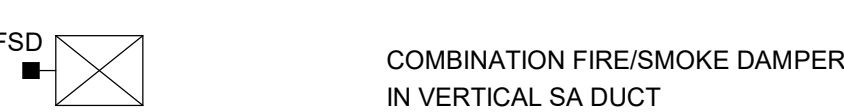
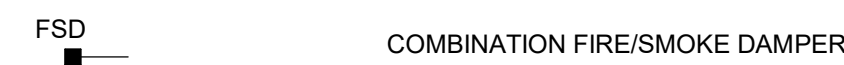
(SOME SYMBOLS MAY NOT BE USED ON THE DRAWINGS)

%	PERCENT	LAT	LEAVING AIR TEMPERATURE
ABS	ABSOLUTE	LBS	POUNDS
ACC	AIR-COOLED CHILLER	LF	LINEAR FEET
ACU	AIR CONDITIONING UNIT	LG	LENGTH
AD	ACCESS DOOR	LPS	LOW PRESSURE STEAM
AF	AIR FOIL	LTHW	LOW TEMPERATURE HOT WATER
AFF	ABOVE FINISHED FLOOR	LWT	LEAVING WATER TEMPERATURE
AHU	AIR HANDLING UNIT	MCA	MINIMUM CIRCUIT AMPACITY
ALT	ALTITUDE	MOCOP	MAXIMUM OVERCURRENT PROTECTION
AMB	AMBIENT	MAX	MAXIMUM
AMCA	AIR MOVEMENT AND CONTROL ASSOCIATION	MBH	BTU PER HOUR (THOUSAND)
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MIN	MINIMUM
APPROX	APPROXIMATE	N.C.	NORMALLY CLOSED
ARI	AIR-CONDITIONING AND REFRIGERATION INSTITUTE	N.O.	NORMALLY OPEN
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR-CONDITIONING ENGINEERS	N/A	NOT APPLICABLE
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	NC	NOISE CRITERIA
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS	NIC	NOT IN CONTRACT
AVG	AVERAGE	NTS	NOT TO SCALE
B	BOILER	OA	OUTSIDE AIR
BD	BACKDRAFT DAMPER	OBD	OPPOSED BLADE DAMPER
BG	BELOW GRADE	OD	OUTSIDE DIAMETER
BEMCS	BUILDING ENERGY MANAGEMENT AND CONTROL SYSTEM	PD	PUMPED DISCHARGE
BHP	BRAKE HORSEPOWER	PBD	PARALLEL BLADE DAMPER
BI	BACKWARD INCLINED	PH	PHASE (ELECTRICAL)
BOD	BOTTOM OF DUCT	PPM	PARTS PER MILLION
BOP	BOTTOM OF PIPE	PRESS	PRESSURE
BTU	BRITISH THERMAL UNIT	PSF	POUNDS PER SQUARE FOOT
BTUH	BTU PER HOUR	PSI	POUNDS PER SQUARE INCH
CD	COLD DECK	PSIA	PSI ABSOLUTE
CF	CUBIC FEET	PSIG	PSI GAGE
CFM	CUBIC FEET PER MINUTE	R	RANKINE
CHET	CHILLED WATER EXPANSION TANK	R-22	REFRIGERANT (NUMBER INDICATES TYPE)
CMPR	COMPRESSOR	RA	RETURN AIR
COND	CONDENSER	RAF	RELIEF AIR FAN
CRAC	COMPUTER ROOM AIR CONDITIONER	RECIRC	RECIRCULATE
CT	COOLING TOWER	RH	RELATIVE HUMIDITY
CHWR	CHILLED WATER RETURN	RHC	REHEAT COIL
CHWS	CHILLED WATER SUPPLY	RPM	REVOLUTIONS PER MINUTE
CU IN	CUBIC INCH	SA	SUPPLY AIR
dB	DECIBEL	SC	SHADING COEFFICIENT
DB	DRY BULB	SCFM	CUBIC FEET PER MINUTE-STANDARD CONDITIONS
DCP	DISTRIBUTED CONTROL PANEL	SD	SMOKE DAMPER
DEG	DEGREE	SEC	SECOND
DIA	DIAMETER	SF	SQUARE FEET
DWG	DRAWING	SG	SPECIFIC GRAVITY
DX	DIRECT-EXPANSION	SHG	SENSIBLE HEAT GAIN
EAT	ENTERING AIR TEMPERATURE	SHR	SENSIBLE HEAT RATIO
EDH	ELECTRIC DUCT HEATER	SP	STATIC PRESSURE
EF	EXHAUST FAN	SPEC	SPECIFICATION
EFF	EFFICIENCY	SQ	SQUARE
EL	ELEVATION	SSD	SUB-SOIL DRAINAGE
ENT	ENTERING	STD	STANDARD
ESP	EXTERNAL STATIC PRESSURE	SUCT	SUCTION
EXP	EXPANSION	t	TIME
F	FAHRENHEIT	T	TEMPERATURE SENSOR
FA	FACE AREA	TD	TEMPERATURE DIFFERENCE
FCU	FAN COIL UNIT	TEMP	TEMPERATURE
FD	FIRE DAMPER	TOC	TOP OF CONCRETE
FH	FUME HOOD	TOD	TOP OF DUCT
FLEX	FLEXIBLE	TONS	TONS OF REFRIGERATION
FPM	FEET PER MINUTE	TOP	TOP OF PIPE
FPS	FEET PER SECOND	TOS	TOP OF STEEL
FRP	FIBERGLASS REINFORCED PIPE	TSP	TOTAL STATIC PRESSURE
FS	FLOW SWITCH	T-STAT	THERMOSTAT
FSD	COMBINATION FIRE-SMOKE DAMPER	TU	TERMINAL UNIT
FT	FEET OR FOOT	TYP	TYPICAL
FTU	FAN TERMINAL UNIT	U	HEAT TRANSFER COEFFICIENT
GA	GAUGE OR GAGE	UH	UNIT HEATER
GAL	GALLONS	UF	UNDER FLOOR
GALV	GALVANIZED	V	VOLT
GPD	GALLONS PER DAY	VA	VOLT AMPERE
GPH	GALLONS PER HOUR	VAC	VACUUM
GPM	GALLONS PER MINUTE	VAV	VARIABLE AIR VOLUME
GR	GRAINS	VD	VOLUME DAMPER
H	ENTHALPY	VENT	VENTILATION
HD	HEAD	VERT	VERTICAL
HD	HOT DECK	VFD	VARIABLE FREQUENCY DRIVE
HG	HEAT GAIN OR MERCURY	VOL	VOLUME
HGT	HEIGHT	VP	VELOCITY PRESSURE
HP	HORSEPOWER	W	HUMIDITY RATIO OR WATT
HPS	HIGH PRESSURE STEAM	W.C.	WATER COLUMN
HR	HOUR	W.G.	WATER GAUGE
HTHW	HIGH TEMPERATURE HEATING WATER	WB	WET BULB
HVAC	HEATING/VENTILATING/AIR-CONDITIONING	WT	WEIGHT
HVU	HEATING AND VENTILATING UNIT	YR	YEAR
HWR	HEATING HOT WATER RETURN		
HWS	HEATING HOT WATER SUPPLY		
HZ	FREQUENCY		
ID	INSIDE DIAMETER		
IPS	INTERNATIONAL PIPE STANDARD		
ips	IRON PIPE SIZE		
K	THERMAL CONDUCTIVITY		
KH	KITCHEN HOOD		
KW	KILOWATT		

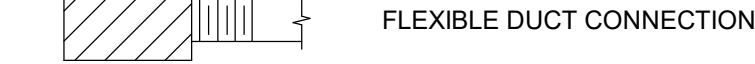
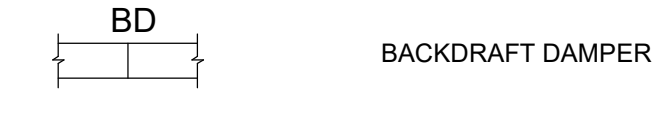
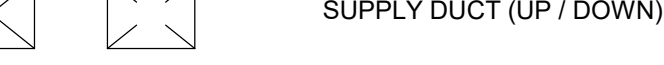
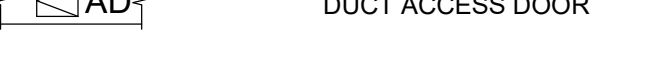
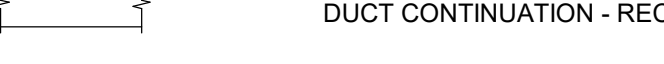
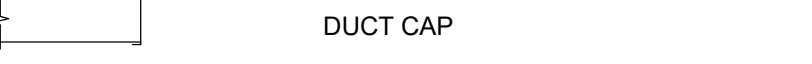
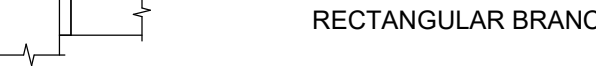
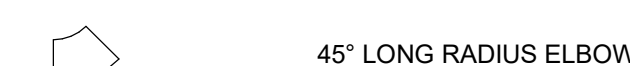
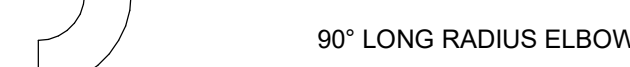
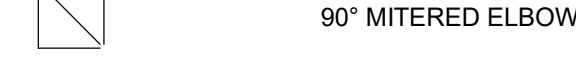
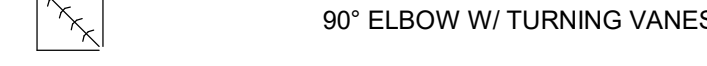
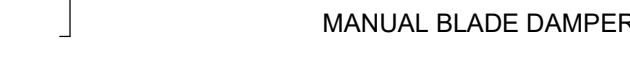
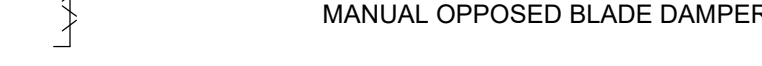
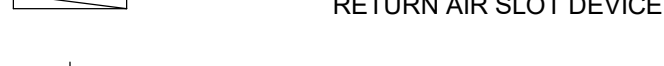
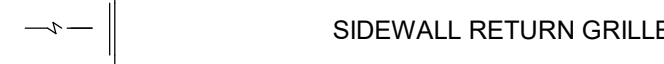
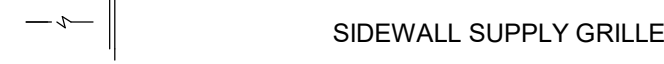
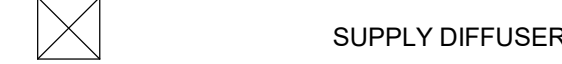
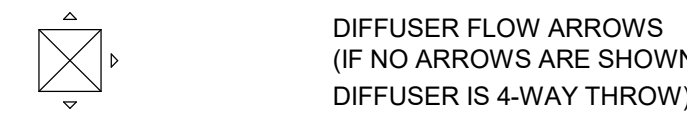
SHEET SYMBOLS



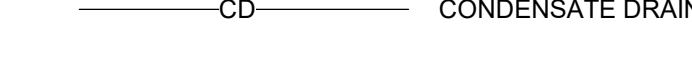
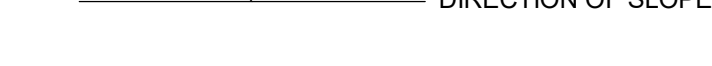
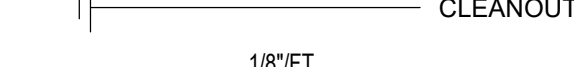
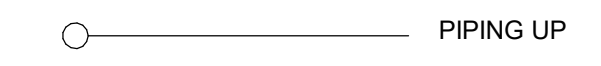
MECHANICAL EQUIPMENT



DUCTWORK



PIPING SYMBOLS



HVAC DESIGN CRITERIA

ASHRAE FUNDAMENTALS - 2017:

SUMMER COOLING DESIGN (0.4%):

WEATHER STATION - SAN ANTONIO, TX

105 °F DRY BULB

ELEVATION: 794'

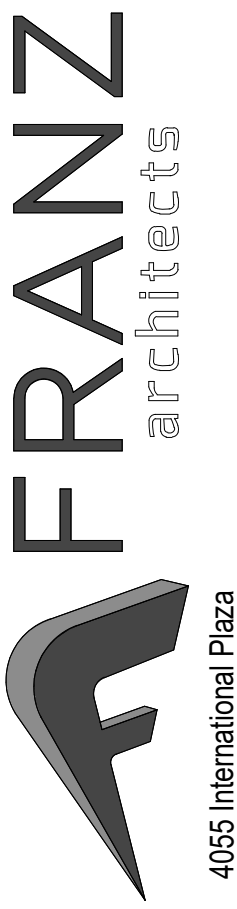
78 °F MEAN COINCIDENT WET BULB

WINTER HEATING DESIGN (99.6%):

20 °F DRY BULB

GENERAL NOTES

- REFER TO SPECIFICATIONS FOR MATERIALS AND METHODS FOR CONSTRUCTION.
- DUCTWORK SIZES SHOWN ARE FREE AIR STREAM DIMENSIONS.
- INSTALL DUCTWORK AND PIPING TO PROVIDE THE MAXIMUM POSSIBLE CLEAR HEIGHT UNDERNEATH. (BETWEEN STRUCTURE OR CEILING AND TOP OF DUCT).
- WHERE APPROVAL CODES HAVE BEEN ESTABLISHED BY OSHA, UNDERWRITER'S LABORATORY, AMERICAN CODES, ANSI, ASME, ASA, ASHRAE, ASTM, ARI, NEL, NFPA, SMACNA, OR THE STATE FIRE INSURANCE REGULATORY BODY, FOLLOW THESE STANDARDS WHETHER OR NOT INDICATED ON THE DRAWINGS AND SPECIFICATIONS.
- PROVIDE THE ENTIRE SYSTEM AND ITS COMPONENT ITEMS OF EQUIPMENT IN OPERATING CONDITION FREE OF OBJECTIONABLE VIBRATION OR NOISE.
- PERFORM WORK IN ACCORDANCE WITH THE LATEST EDITIONS, REVISIONS, AMENDMENTS OR SUPPLEMENTS OF APPLICABLE STATUTES, ORDINANCES, CODES OR REGULATIONS OF FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION IN EFFECT ON THE DATE BIDS ARE RECEIVED.
- COORDINATE WORK SO THAT INTERFERENCES BETWEEN PIPING, DUCTWORK, EQUIPMENT, PLUMBING WORK, ELECTRICAL WORK, AND BUILDING STRUCTURE WILL BE AVOIDED.
- FURNISH ACCESS DOORS FOR INSTALLATION IN WALLS AND CEILINGS WHERE ACCESS IS REQUIRED TO CONCEALED MECHANICAL EQUIPMENT, VALVES, CONTROLS AND OTHER DEVICES.
- COORDINATE THE EXACT LOCATION OF DRAIN AND MECHANICAL EQUIPMENT LOCATIONS WITH MECHANICAL, ARCHITECTURAL, AND STRUCTURAL DRAWINGS PRIOR TO INSTALLATION.
- RECTANGULAR ELBOWS SHALL BE LONG-RADIUS ELBOWS UNLESS OTHERWISE SHOWN OR NOTED. SUPPLY AIR STANDARD NON-RADIUS 90° ELBOWS SHALL HAVE TURNING VANES.
- AIR CONDITIONING LOAD CALCULATIONS BASED ON LOCAL CLIMATE DATA. ADJUST UNIT SIZES, AIRFLOW, DUCT SIZES AND AIR DEVICES TO HVAC LOAD CALCULATIONS BASED ON STORE LOCATION. COORDINATE RTU LOCATIONS, DIMENSIONS, AND WEIGHTS WITH STRUCTURAL ENGINEER AND ARCHITECT.



(817) 737-9922
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4055 International Plaza
Suite 100
Fort Worth, Texas 76109

Date	Description
02.08.2024	REVIEW SET
03.15.2024	PERMIT SET



796 Menus Court
St. Louis, MO 63026
T 636.349.1600
F 636.349.1730
CERTIFICATE OF AUTHORITY NO. F-20080

Seal / Signature



03/15/2024

Project Name PT22M

29639 FM 1093 ROAD -

FULSHEAR, TX 77441

Project Number

23210

Description

GENERAL NOTES, SYMBOLS AND

ABBREVIATIONS

Scale

12" = 1'-0"

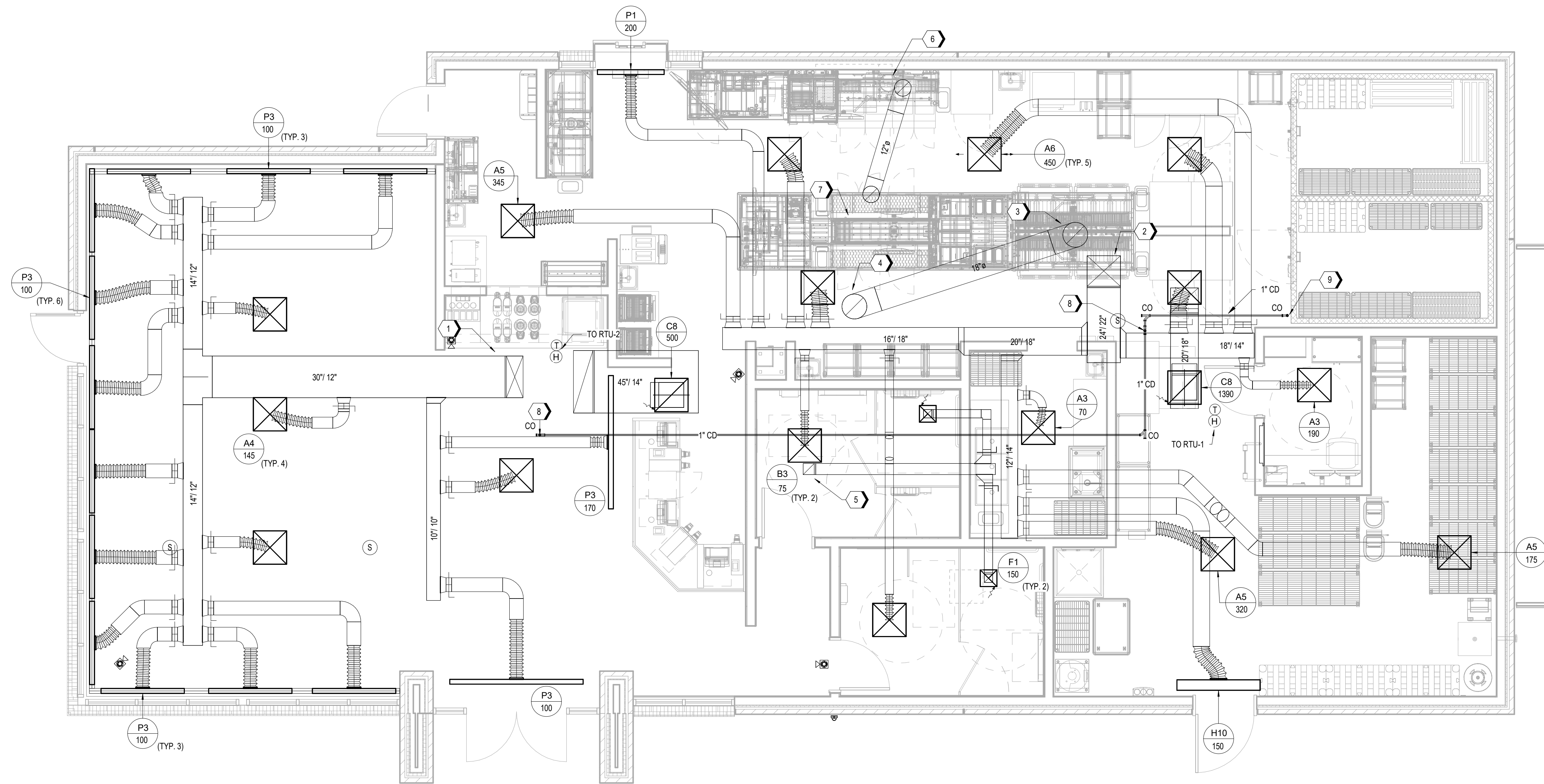
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KEYNOTES

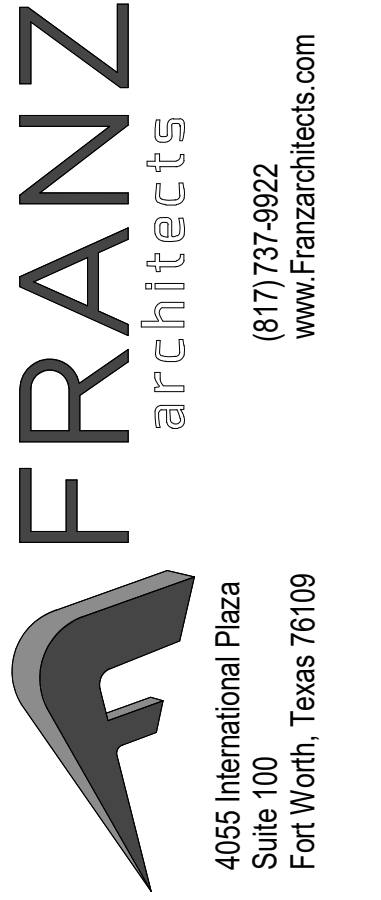
- 30"12 SUPPLY DUCT UP TO RTU-2. PROVIDE DUCT TRANSITION AS REQUIRED TO MATCH UNIT CONNECTION SIZE.
- 24"22 SUPPLY DUCT UP TO RTU-1. PROVIDE DUCT TRANSITION AS REQUIRED TO MATCH UNIT CONNECTION SIZE.
- CONNECT KITCHEN EXHAUST HOOD ABOVE GRILL UP TO KEF-1 WITH 18" DIA. PREFABRICATED UL 1978 LISTED AND LABELED GREASE DUCT. PROVIDE TRANSITIONS ABOVE CEILING AS REQUIRED.
- 18" EXHAUST DUCT UP TO KEF-1 ON ROOF. RE: A1M2.1
- 8"x8" EXHAUST DUCT UP TO EF-1.
- CONNECT KITCHEN EXHAUST HOOD ABOVE FRYER UP TO KEF-2 WITH 12" DIA. PREFABRICATED UL 1978 LISTED AND LABELED GREASE DUCT. PROVIDE TRANSITIONS ABOVE CEILING AS REQUIRED.
- 12" EXHAUST DUCT UP TO KEF-2 ON ROOF. RE: A1M2.1
- FULLY INSULATED COPPER CONDENSATE UP THROUGH ROOF.
- CONDENSATE DOWN TO FLOOR SINK. TERMINATE CONDENSATE WITH 1" AIR GAP.

GENERAL NOTES

- REFER TO M0.1 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
- SMOKE DETECTORS SHALL BE PROVIDED BY THE FIRE ALARM CONTRACTOR AND INSTALLED IN THE SUPPLY AND RETURN SIDES OF RTU. COORDINATE WIRING FOR SHUTDOWN WITH ELECTRICAL SCOPE. MOUNT SMOKE DETECTORS IN ACCESSIBLE LOCATIONS. REFERENCE M6.1 FOR RTU SCHEDULE. ACTIVATION OF SMOKE DETECTORS SHALL SHUT DOWN RTU AND ACTIVATE THE AUDIBLE AND VISUAL SIGNAL PROVIDED.
- THE PILOT RDM SYSTEM SHALL BE MOUNTED AND INSTALLED FLUSH IN THE MANAGERS OFFICE AT 5' AFF TO CENTER.
- PER IECC 2018, PARAGRAPH C408.2.1, A THIRD PARTY SHALL BE HIRED BY THE OWNER AS PART OF THIS PROJECT TO PROVIDE/PERFORM THE FOLLOWING ITEMS:
 - A NARRATIVE DESCRIPTION OF THE ACTIVITIES THAT WILL BE ACCOMPLISHED DURING EACH PHASE OF COMMISSIONING, INCLUDING THE PERSONNEL INTENDED TO ACCOMPLISH EACH OF THE ACTIVITIES.
 - A LISTING OF THE SPECIFIC EQUIPMENT, APPLIANCES OR SYSTEMS TO BE TESTED AND A DESCRIPTION OF THE TESTS TO BE PERFORMED.
 - FUNCTIONS TO BE TESTED INCLUDING, BUT NOT LIMITED TO, CALIBRATIONS AND ECONOMIZER CONTROLS.
 - CONDITIONS UNDER WHICH THE TEST WILL BE PERFORMED. TESTING SHALL AFFIRM WINTER AND SUMMER DESIGN CONDITIONS AND FULL OUTSIDE AIR CONDITIONS.
 - MEASURABLE CRITERIA FOR PERFORMANCE.
- KITCHEN HOODS, ANSUL FIRE SUPPRESSION SYSTEM AND HOOD CONTROLS SHALL BE OWNER-FURNISHED AND CONTRACTOR-INSTALLED.
- TEMPERATURE SENSORS "T" AND HUMIDITY SENSORS "H" ARE TO BE CEILING MOUNTED AND TIED INTO THE BUILDING CONTROL SYSTEM.
- ALL TESTS AND BALANCES TO BE PERFORMED BY A THIRD PARTY - NOT BY MEP SUBCONTRACTOR.



A1 MECHANICAL FLOOR PLAN - LEVEL 1
1/4" = 1'-0"



Date	Description
02.08.2024	REVIEW SET
03.15.2024	PERMIT SET

CASE
Engineering Inc.
796 Merus Court
St. Louis, MO 63026
T 636.349.1600
F 636.349.1730
CERTIFICATE OF AUTHORITY NO. F-20080

Seal / Signature

Project Name PT22M
29639 FM 1093 ROAD -
FULSHEAR, TX 77441
Project Number
23210
Description
MECHANICAL FLOOR PLAN

Scale
1/4" = 1'-0"

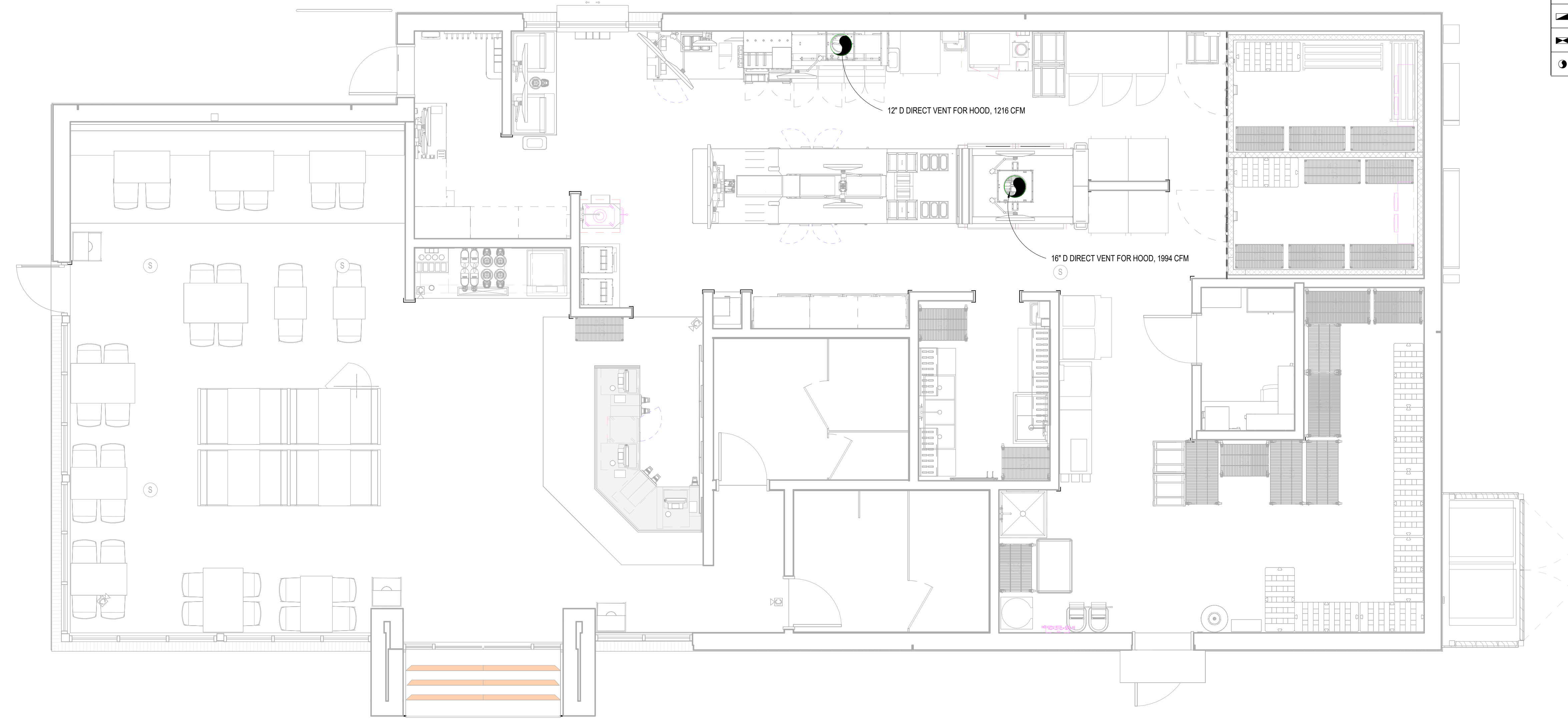
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Benbrook, Texas 76126

MECHANICAL LEGEND	
	EXHAUST DUCT CONNECTION
	MAKE-UP AIR DUCT CONNECTION
	DIRECT VENT, GRAVITY TYPE



1 FIRST FLOOR - MECHANICAL PLAN
SCALE 1/4" = 1'-0"

MECHANICAL SCHEDULE										
Item #	Qty.	Description	Manufacturer	Model	CFM	Exhaust Diameter	SP	Make-Up CFM	Remarks	Assembly Code
150	1	87" DOUBLE SIDED GRILL HOOD	H&K DALLAS INC.	CUSTOM	1994 CFM	1' - 4"				
178	1	10 BASKET FRYER HOOD	H&K DALLAS INC.	CUSTOM	1216 CFM	1' - 0"				90729

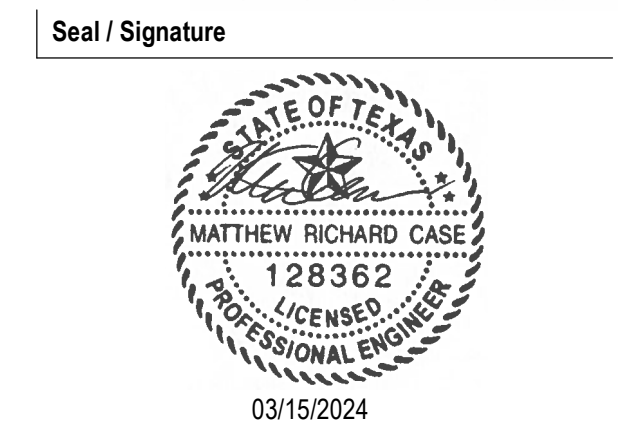
ABBREVIATIONS KEY					
ELECTRICAL		PLUMBING		GENERAL APPLICATION	
V	VOLTAGE	HW	HOT WATER	AFF	ABOVE FINISH FLOOR
PH	PHASE	CW	COLD WATER	BFF	BELOW FINISH FLOOR
AMP	AMPERAGE	DW	DIRECT WASTE	BTC	BRANCH TO CONNECTION
KW	KILOWATT	IW	INDIRECT WASTE	DFA	DOWN FROM ABOVE
HP	HORSEPOWER	G	GAS	CL	CENTERLINE
SR	HORSEPOWER	BTU	BRITISH THERMAL UNIT	NIC	NOT IN CONTRACT
DR	DUPLEX RECEPTACLE	S	STEAM INLET	GENERAL APPLICATION	
QR	QUAD RECEPTACLE	SR	STEAM RETURN	ARCH	ARCHITECT
JB	JUNCTION BOX	FS	FLOOR SINK	ID	INTERIOR DESIGNER
CP	CORD & PLUG	FD	FLOOR DRAIN	MEP	MECHANICAL ENGINEERING FIRM
DC	DIRECT CONNECTION	FFD	FUNNEL FLOOR DRAIN	FSC	FOODSERVICE CONSULTANT
MECHANICAL		WF	WATER FILTER	KEC	KITCHEN EQUIPMENT CONTRACTOR
CFM	CUBIC FEET PER MINUTE			MW	MILLWORK CONTRACTOR
SP	STATIC PRESSURE				
FSS	VOLTAGE				

TRADES KEY				
GC	EC	PC	HVAC	KEC
GENERAL CONTRACTOR	ELECTRICAL CONTRACTOR	PLUMBING CONTRACTOR	HEATING, VENTILATION & AIR-CONDITIONING CONTRACTOR	KITCHEN EQUIPMENT CONTRACTOR

VENTILATION NOTES	
1.	KITCHEN EQUIPMENT CONTRACTOR SHALL PROVIDE ALL HANGING MATERIALS FOR EXHAUST HOOD.
2.	MECHANICAL CONTRACTOR SHALL CONNECT EXHAUST HOOD TO DUCT WORK.
3.	ALL EXHAUST AND SUPPLY AIR FANS, AND FAN CONTROLS BY OTHERS - VERIFY W/ ARCHITECT / ENGINEER.

Date	Description
	Prototype Version
	Prototype Release

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Project Name PT22M
29639 FM 1093 ROAD - FULSHEAR, TX 77441
Project Number 23269
Description MECHANICAL PLAN

Scale As indicated

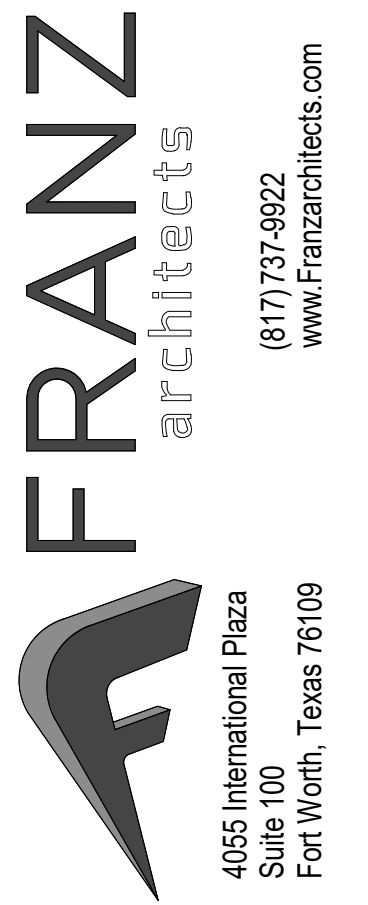
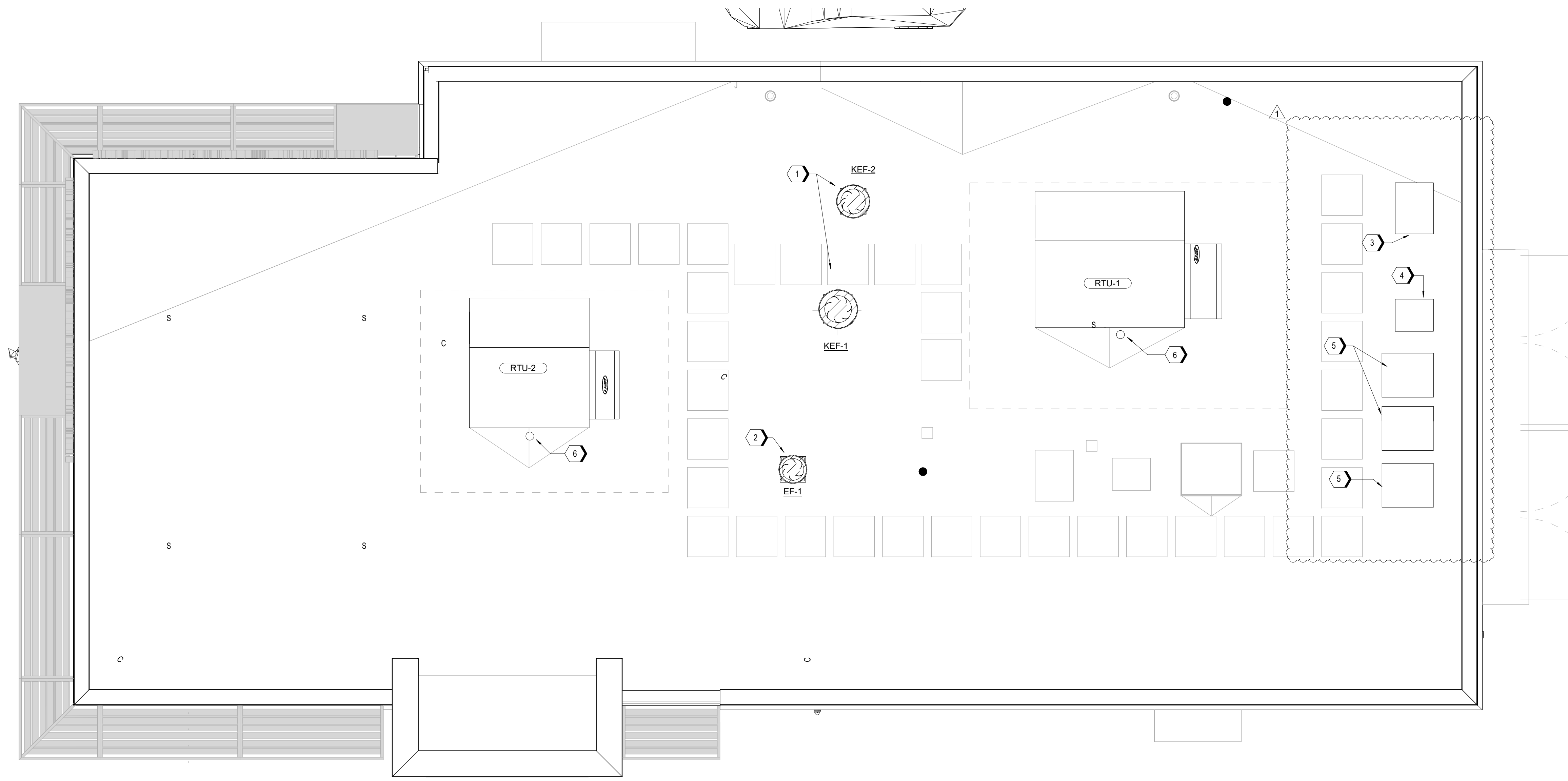
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KEYNOTES

1. CENTRIFUGAL UPBLAST GREASE HOOD EXHAUST FAN MOUNTED ON MANUFACTURER PROVIDED ROOF CURB, RE: A2/M5.1
2. CENTRIFUGAL DOWNBLAST EXHAUST FAN MOUNTED ON MANUFACTURER PROVIDED ROOF CURB, RE: A1/M5.1
3. KITCHEN FREEZER CONDENSING UNIT MOUNTED ON ROOFTOP. FURNISHED BY OWNER, COORDINATE EXACT LOCATION ONO SITE AND ROUTE REFRIGERATION (BY OTHERS).
4. KITCHEN REFRIGERATOR CONDENSING UNIT MOUNTED ON ROOFTOP. FURNISHED BY OWNER, COORDINATE EXACT LOCATION ON SITE AND ROUTE REFRIGERATION PIPING THROUGH ROOF PENETRATION (BY OTHERS).
5. KITCHEN ICEMAKER CONDENSING UNIT MOUNTED ON ROOFTOP. FURNISHED BY OWNER, COORDINATE EXACT LOCATION ON SITE AND ROUTE REFRIGERATION PIPING THROUGH ROOF PENETRATION (BY OTHERS).
7. ROUTE CONDENSATE LINE DOWN THROUGH ROOF. RE:A1/M1.1 FOR CONTINUATION.

GENERAL NOTES

- A. REFER TO M0.1 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
- B. SMOKE DETECTORS SHALL BE PROVIDED BY THE FIRE ALARM CONTRACTOR AND INSTALLED IN THE SUPPLY AND RETURN SIDES OF RTU. COORDINATE WIRING FOR SHUTDOWN WITH ELECTRICAL SCOPE. MOUNT SMOKE DETECTORS IN ACCESSIBLE LOCATIONS. REFERENCE M6.1 FOR RTU SCHEDULE. ACTIVATION OF SMOKE DETECTORS SHALL SHUT DOWN RTU AND ACTIVATE THE AUDIBLE AND VISUAL SIGNAL PROVIDED.
- C. THE PILOT RDM SYSTEM SHALL BE MOUNTED AND INSTALLED FLUSH IN THE MANAGERS OFFICE AT 5' AFF TO CENTER.
- D. PER IECC 2018, PARAGRAPH C408.2.1, A THIRD PARTY SHALL BE HIRED BY THE OWNER AS PART OF THIS PROJECT TO PROVIDE/PERFORM THE FOLLOWING ITEMS:
 - A NARRATIVE DESCRIPTION OF THE ACTIVITIES THAT WILL BE ACCOMPLISHED DURING EACH PHASE OF COMMISSIONING, INCLUDING THE PERSONNEL INTENDED TO ACCOMPLISH EACH OF THE ACTIVITIES.
 - A LISTING OF THE SPECIFIC EQUIPMENT, APPLIANCES OR SYSTEMS TO BE TESTED AND A DESCRIPTION OF THE TESTS TO BE PERFORMED.
 - FUNCTIONS TO BE TESTED INCLUDING, BUT NOT LIMITED TO, CALIBRATIONS AND ECONOMIZER CONTROLS.
 - CONDITIONS UNDER WHICH THE TEST WILL BE PERFORMED. TESTING SHALL AFFIRM WINTER AND SUMMER DESIGN CONDITIONS AND FULL OUTSIDE AIR CONDITIONS.
 - MEASURABLE CRITERIA FOR PERFORMANCE.
- E. KITCHEN HOODS, ANSUL FIRE SUPPRESSION SYSTEM AND HOOD CONTROLS SHALL BE OWNER-FURNISHED AND CONTRACTOR-INSTALLED.
- F. TEMPERATURE SENSORS "T" AND HUMIDITY SENSORS "H" ARE TO BE CEILING MOUNTED AND TIED INTO THE BUILDING CONTROL SYSTEM.
- G. ALL TESTS AND BALANCES TO BE PERFORMED BY A THIRD PARTY - NOT BY MEP SUBCONTRACTOR.



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Date	Description
02.08.2024	REVIEW SET
03.15.2024	PERMIT SET
1 01.31.2025	Q4 UPDATE

CASE Engineering Inc.

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CERTIFICATE OF AUTHORITY NO. F-20080

Seal / Signature



03/15/2024

Project Name PT22M
29639 FM 1093 ROAD - FULSHEAR, TX 77441

Project Number
23210

Description
MECHANICAL ROOF PLAN

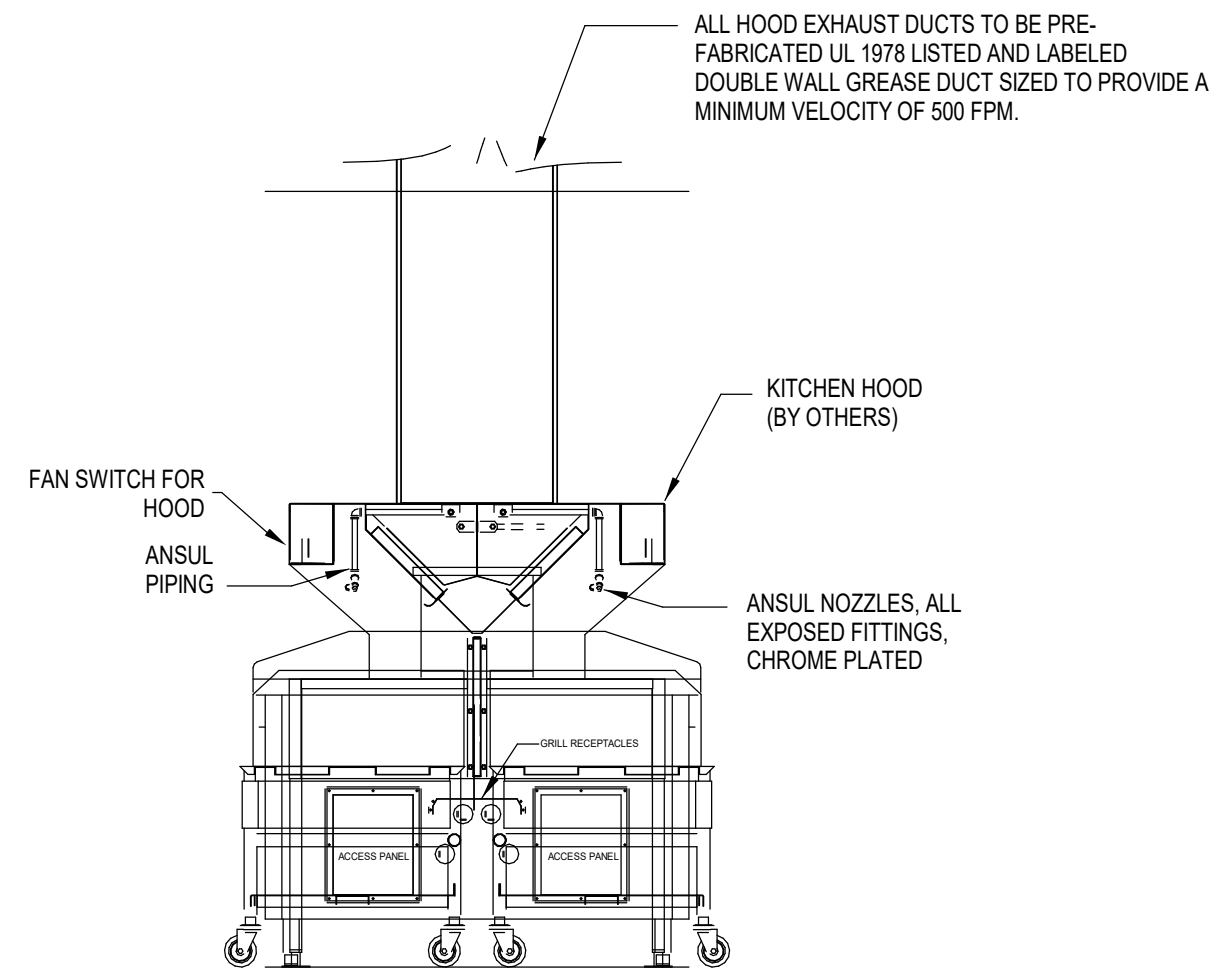
Scale
1/4" = 1'-0"

M2.1

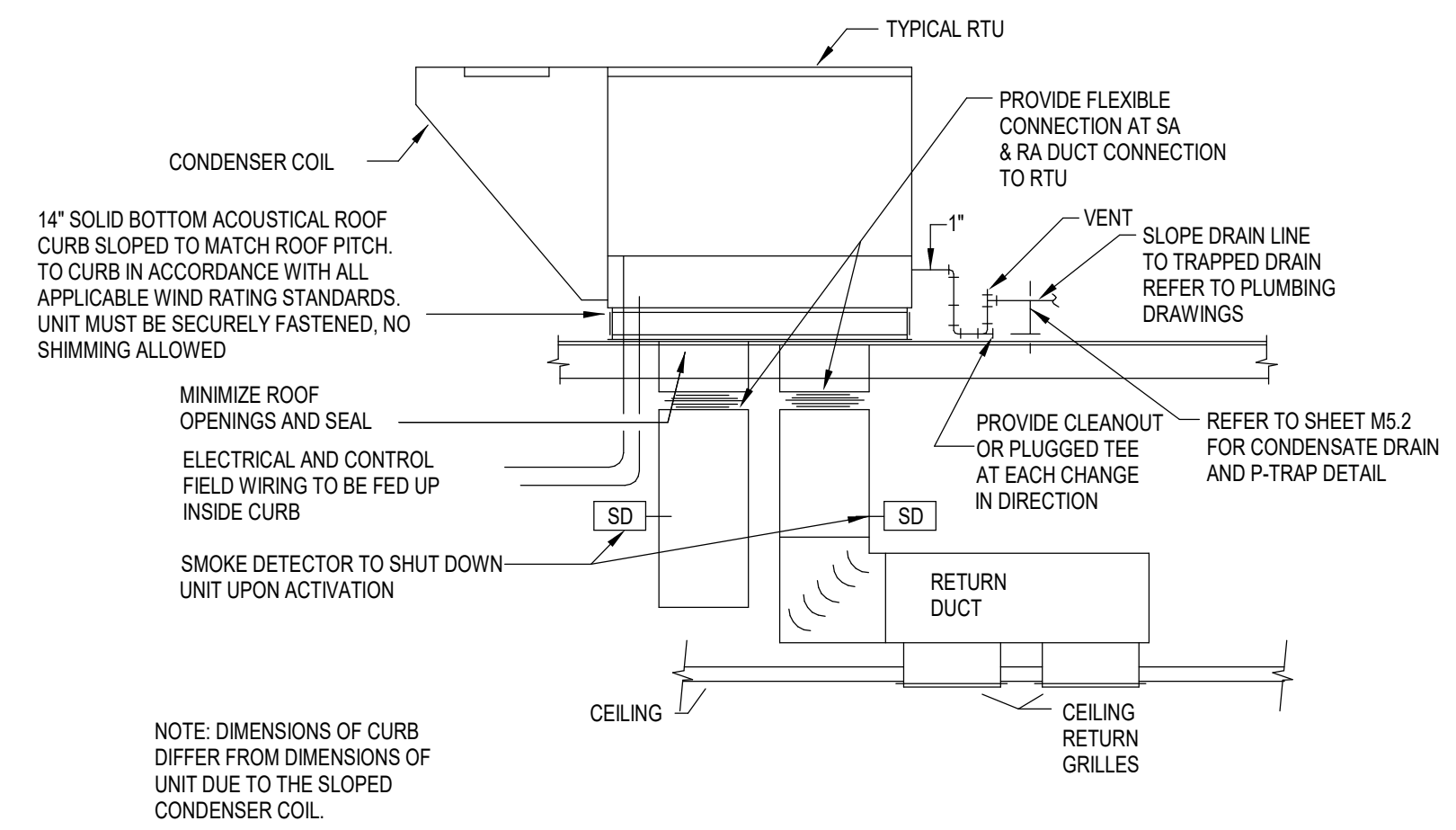
A1 MECHANICAL ROOF PLAN

1/4" = 1'-0"

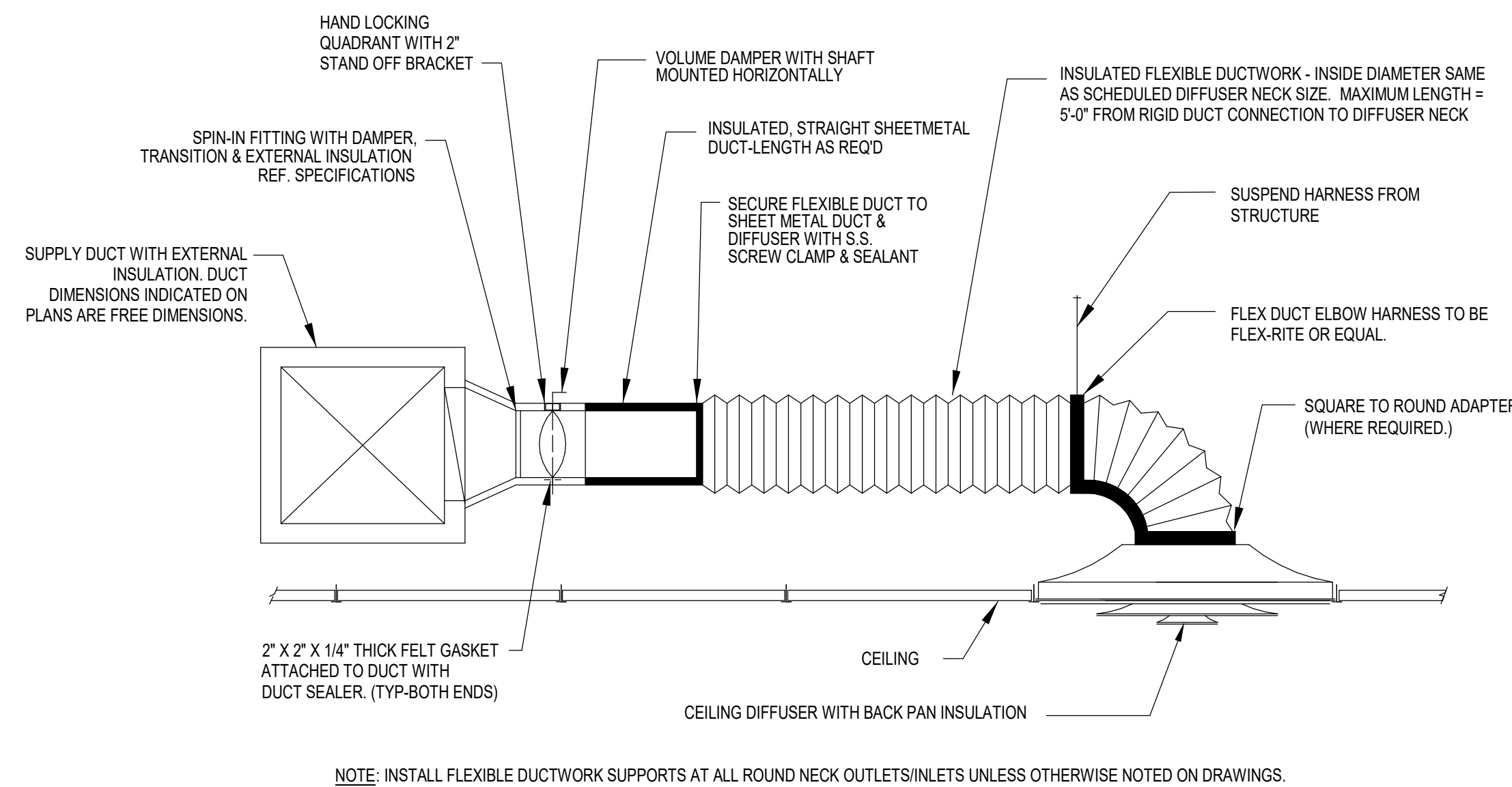
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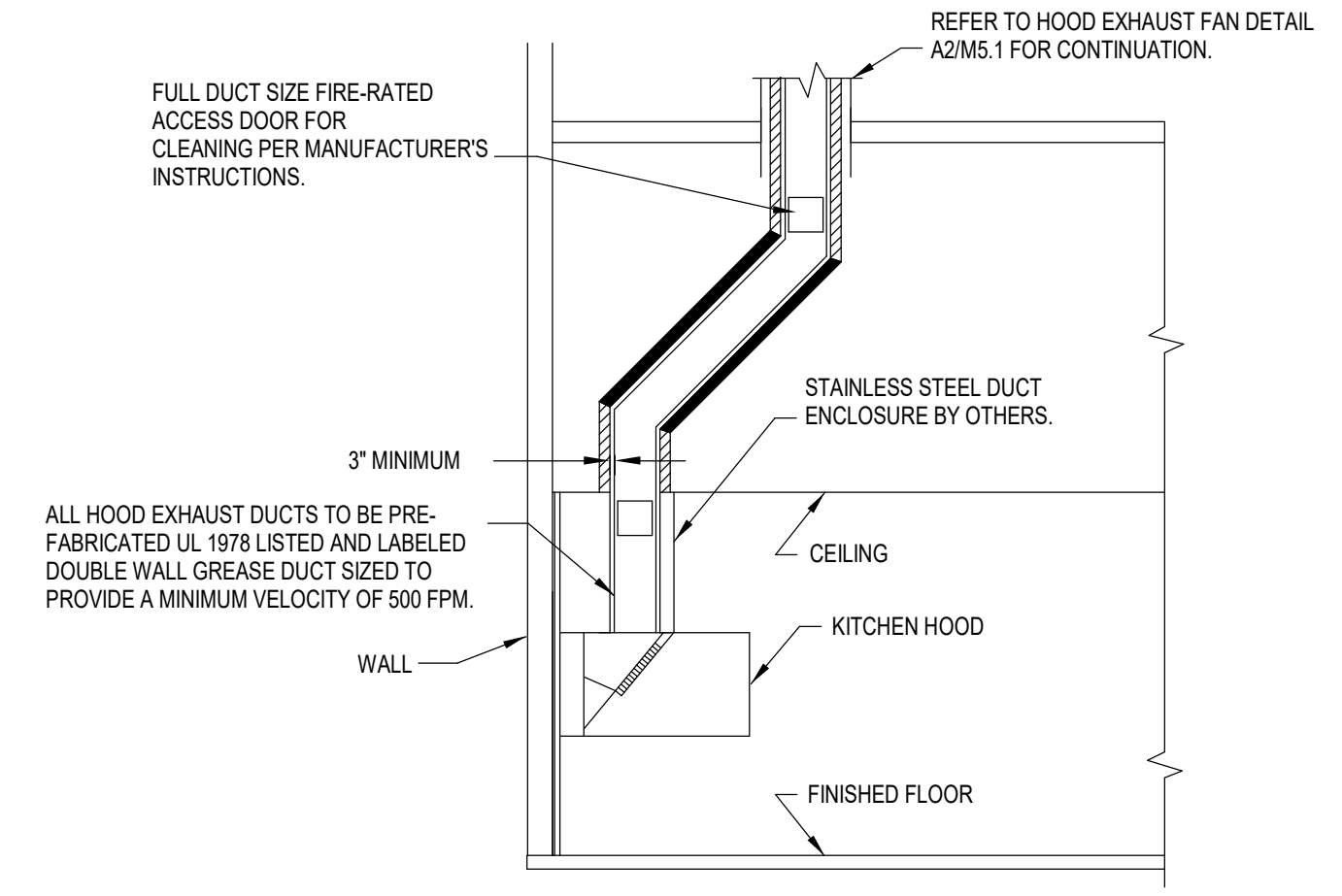
C3 LOW PROFILE HOOD DETAIL
N.T.S.



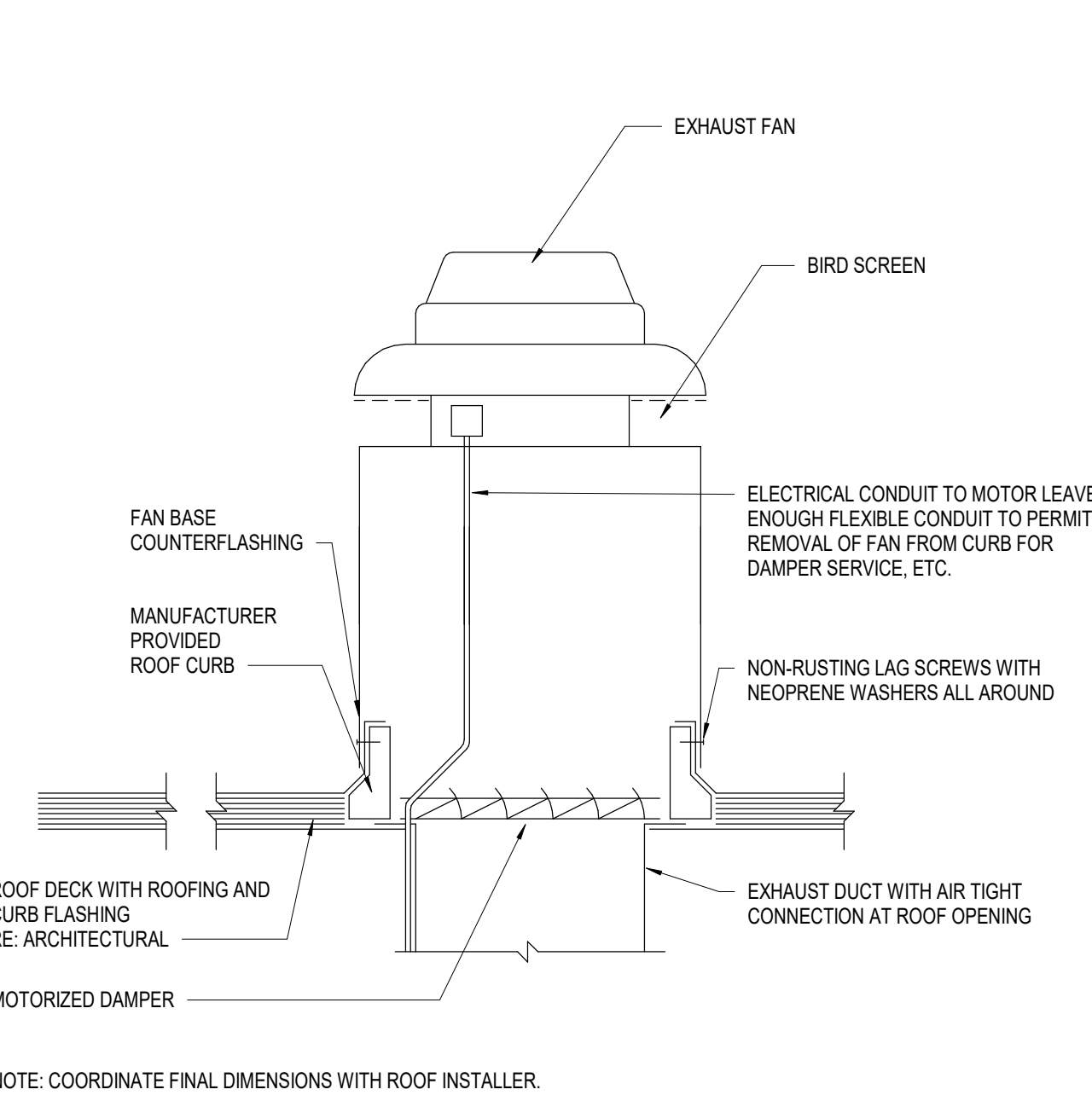
C4 ROOFTOP HVAC UNIT DETAIL
N.T.S.



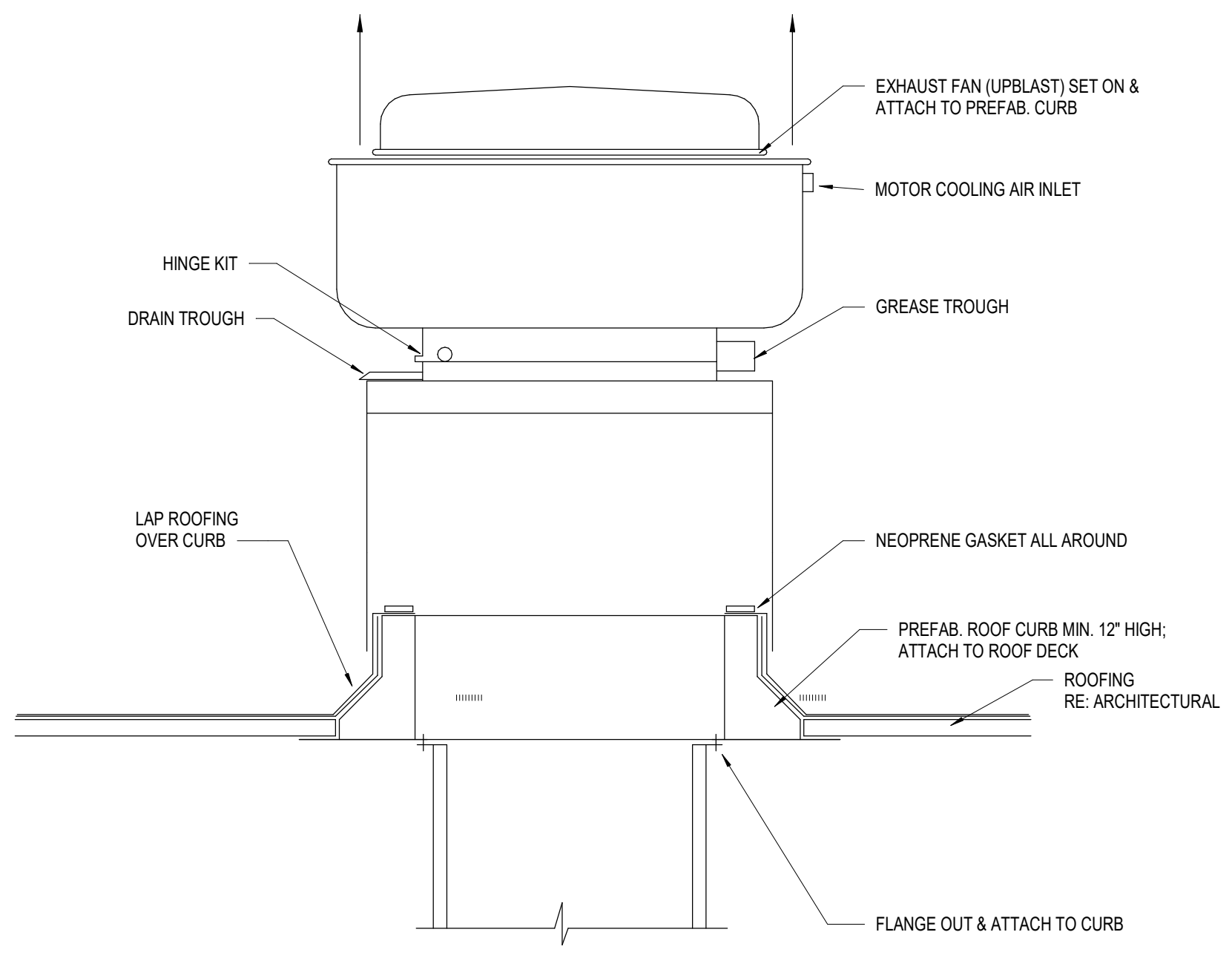
B2 DIFFUSER CONNECTION DETAIL
N.T.S.



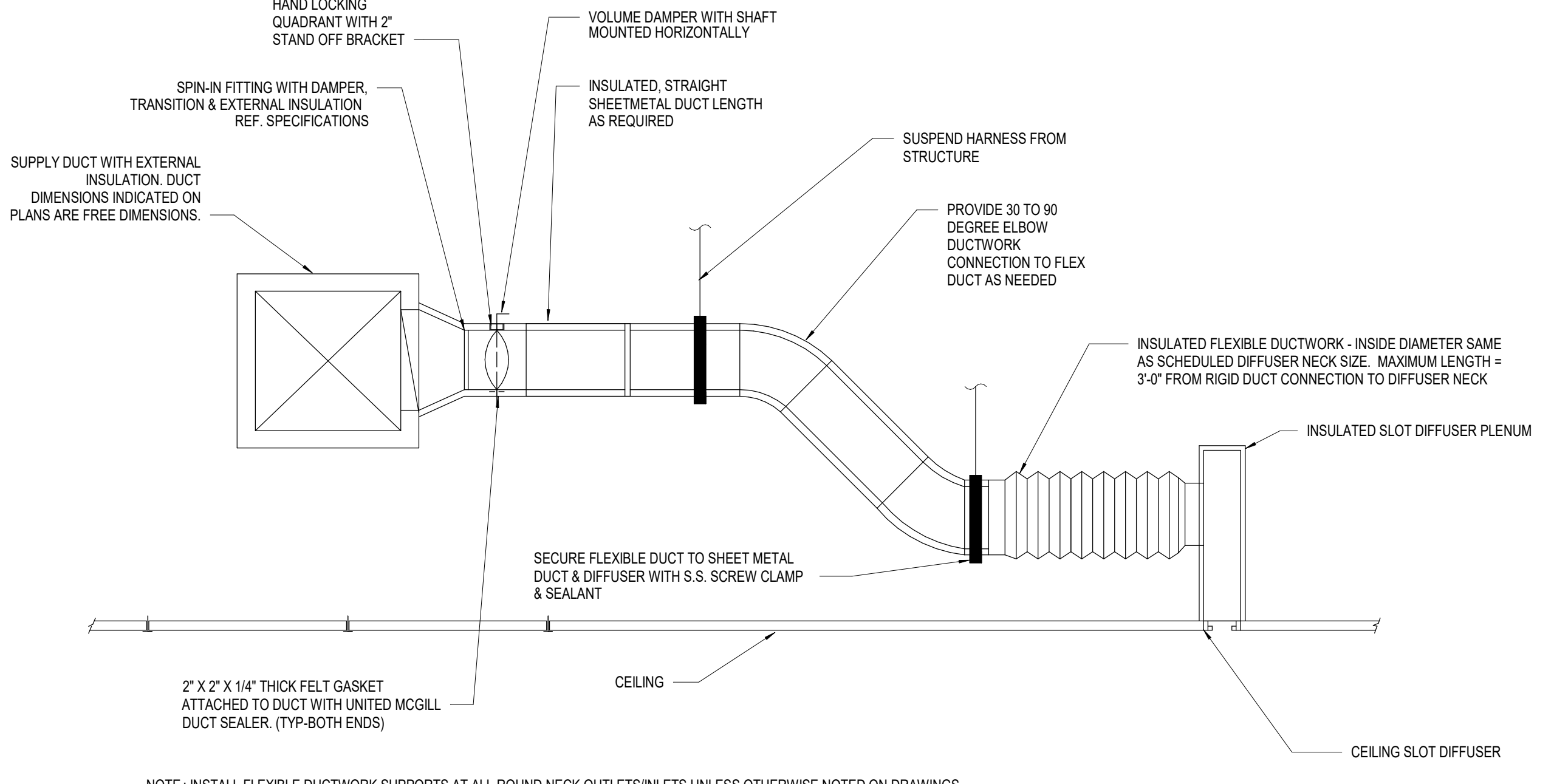
B4 HOOD EXHAUST DUCT DETAIL
N.T.S.



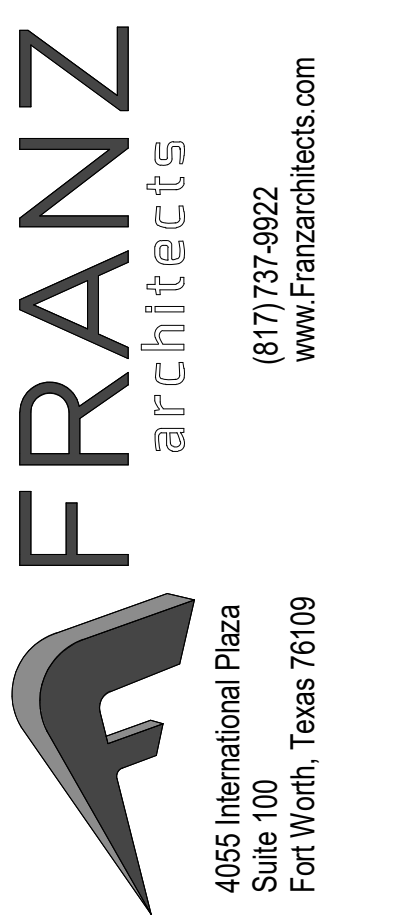
A1 ROOF MOUNTED EXHAUST FAN AND CURB DETAIL
N.T.S.



A2 ROOFTOP GREASE EXHAUST FAN DETAIL
N.T.S.



A3 PLENUM SLOT DIFFUSER DETAIL
N.T.S.



Date	Description
02.08.2024	REVIEW SET
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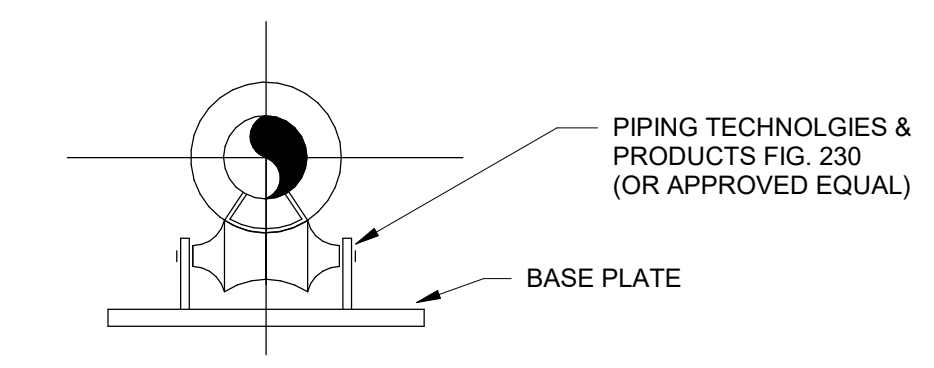
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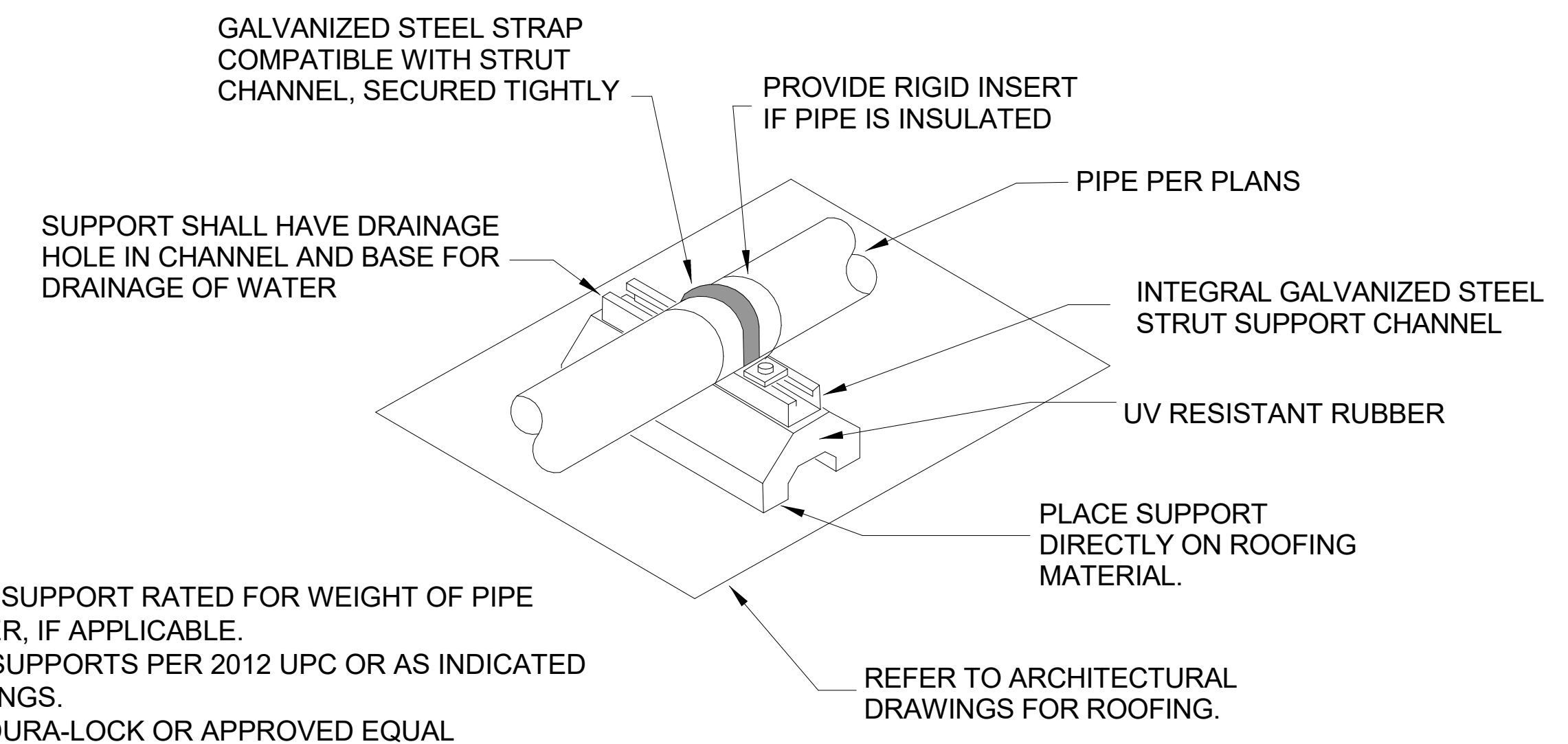
Project Name: PT22M
 29639 FM 1093 ROAD - FULSHEAR, TX 77441
 Project Number: 23210
 Description: MECHANICAL DETAILS

Scale: N.T.S.

M5.1

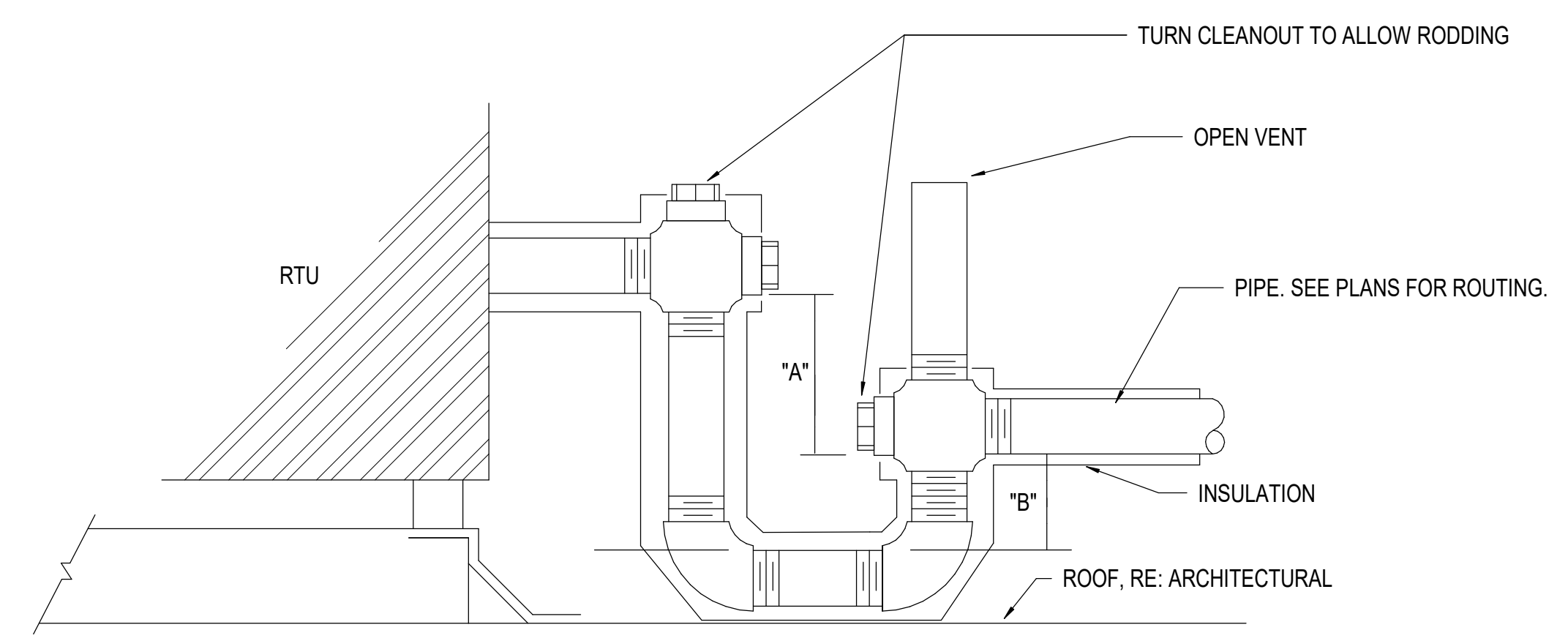


A4 PIPE SUPPORT ROLLER STAND
N.T.S.



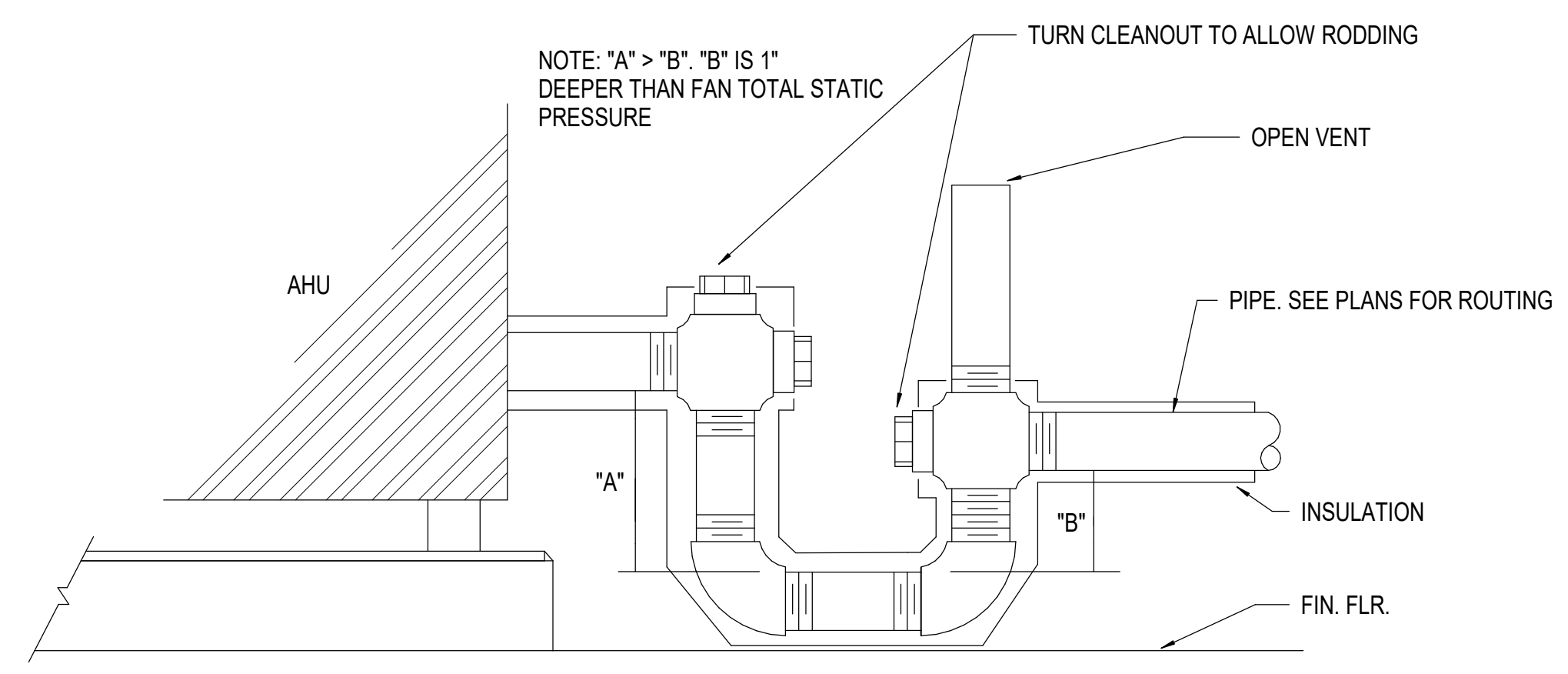
NOTES:
 1. SELECT SUPPORT RATED FOR WEIGHT OF PIPE AND WATER, IF APPLICABLE.
 2. SPACE SUPPORTS PER 2012 UPC OR AS INDICATED ON DRAWINGS.
 3. B-LINE DURA-LOCK OR APPROVED EQUAL

A5 DURA-BLOCK SUPPORT
N.T.S.



A1 DRAW-THRU RTU CONDENSATE DRAIN
N.T.S.

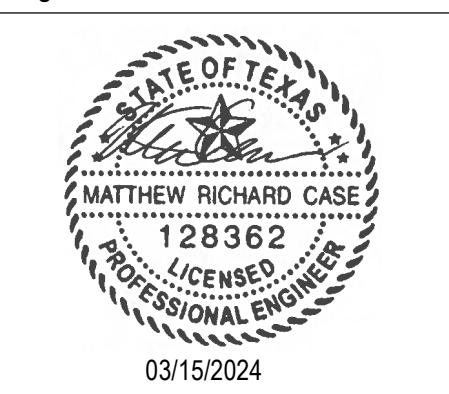
NOTE: "A" = TSP+1
 "B" = 1/2TSP+1



A3 BLOW-THRU AHU CONDENSATE DRAIN
N.T.S.

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Scale
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M5.2

****THE AMBIENT CONDITIONS FOR THIS PROTOTYPE ARE 105/78 °F DB/WB COOLING AND 20 °F DB HEATING. CHECK WITH LOCAL ENGINEER FOR REGIONAL CHANGES IN DESIGN CONDITIONS.****

ROOFTOP UNIT SCHEDULE		
MARK	RTU-1	RTU-2
SERVES	KITCHEN	DINING
TOTAL AIR (CFM)	3850	2050
OUTSIDE AIR (CFM)	2460	1550
APPROX. EXT S.P. ("WG) *	0.75	0.50
FAN MOTOR (MIN. HP)	3.00	2.00
AMBIENT TEMP. (F)	105	105
COOLING SECTION		
TYPE	DX	DX
REFRIG. TYPE	R-410A	R-410A
FAN RPM	928	1184
ENT. AIR TEMP (DBWB)	94.2 / 72.6	97.7 / 74.3
LEA. AIR TEMP (DBWB)	53.1 / 53.1	50.6/50.5
OUTPUT-TOTAL (MBH)	220.3	124.1
OUTPUT-SENS (MBH)	123.0	93.4
HEATING SECTION		
TYPE	ELECTRIC	ELECTRIC
STAGES	1	1
ENT. AIR TEMP (DB)	43.5	35.9
LEA. AIR TEMP (DB)	94.2	95.6
ELECTRIC HEAT FLA	167	104
OUTPUT (MIN. MBH)	205.1	128.3
ELECTRICAL		
UNIT VOLTS / PHASE	208/3	208/3
MCA	180	140
MOCP	200	150
WEIGHT	2492	1925
FILTER	MERV 8	MERV 8
REFERENCE	AAON	AAON
MODEL NO.	RN-020-8-0-GB04-179	RN-013-8-0-GB04-159
NOTES	1-13	1-13

- NOTES:
- PROVIDE WITH PREMIUM EFFICIENCY MOTORS IN ACCORDANCE WITH NEMA MG-1.
 - PROVIDE WITH SUPPLY AND RETURN SMOKE DETECTORS TO SHUT DOWN UNIT UPON SMOKE DETECTION.
 - PROVIDE WITH TERMINAL STRIP FOR FIELD INSTALLED CONTROLS.
 - UNITS TO BE 2" DOUBLE WALL R-13 CONSTRUCTION WITH 2500 HOUR SALT SPRAY RESISTANT PAINT.
 - UNIT TO HAVE MODULATING HOT GAS REHEAT AND MODULATE HEAT CONTROL.
 - MECHANICAL CONTRACTOR RESPONSIBLE FOR INSTALLING (2) FACTORY PROVIDED SUPPLY AIR TEMPERATURE SENSORS.
 - PROVIDE FACTORY INSTALLED HAIL GUARDS
 - PROVIDE 6 ROW DX COIL AND STAINLESS STEEL DRAIN PAN.
 - PROVIDE ULTRA LOW LEAKAGE ECONOMIZER WITH BAROMETRIC RELIEF DAMPER, AND FAULT DETECTION AND DIAGNOSTIC.
 - PROVIDE FACTORY MOUNTED AND WIRED CONDENSATE FLOW SWITCH.
 - PROVIDE STAINLESS STEEL GAS HEAT EXCHANGER WITH MODULATING CONTROL.
 - PROVIDE FACTORY POWERED GFCI CONVENIENCE OUTLET AND NONFUSED DISCONNECT.
 - PROVIDE 18" INSULATED, SOLID BOTTOM CURBED FOR PITCHED ROOF. MECHANICAL CONTRACTOR TO FIELD CUT SUPPLY AND RETURN OPENINGS AS REQUIRED.
 - AAON UNITS PROVIDED BY WHATABURGER. FACTORY STARTUP IS INCLUDED. CONTACT AARON HUMPHRIES @ 210-954-6657 OR aaron.humphries@texasairsystems.com TO COORDINATE STARTUP.

FLEX DUCT SCHEDULE	
CFM RANGE	SIZE (DIAMETER) *
< 50	5
51 - 100	6
101 - 250	8
251 - 400	10
401 - 650	12
651 - 900	14
901 - 1300	16
1301 - 1800	18
1801 - 2300	20

*ALL FLEX DUCT SHALL BE SIZED IN ACCORDANCE W/ FLEX DUCT SCHEDULE. PROVIDE RIGID REDUCER AT NECK OF AIR DEVICE, VAV INLET DUCT, ETC. TO TRANSITION FROM FLEX DUCT SIZE TO DIFFUSER INLET AND/OR EQUIPMENT CONNECTION SIZE. FLEX DUCT NOT TO EXCEED 5ft.

EXHAUST FAN SCHEDULE

TAG	TYPE	MANUFACTURER	MODEL	AIR FLOW	TSP (IN W.C.)	RPM	BHP	HP	DRIVE TYPE	VOLTAGE	PHASE	WEIGHT (LBS.)	NOTES
EF-1	ROOF-MOUNTED CENTRIFUGAL DOWNBLAST	GREENHECK	C-080-VG	300 CFM	0.50	1680	0.07	0.10	DIRECT	120	1	44	1.2
KEF-1	ROOF-MOUNTED CENTRIFUGAL UPBLAST	GREENHECK	CUE-140-VG	1995 CFM	1.00	1517	0.66	0.75	DIRECT	208	1	119	2,3,4,6
KEF-2	ROOF-MOUNTED CENTRIFUGAL UPBLAST	GREENHECK	CUE-120-VG	1216 CFM	0.75	1415	0.26	0.50	DIRECT	208	1	96	2,3,5,6

- NOTES:
- PROVIDE INSULATED 12" ROOF CURB.
 - PROVIDE WITH INTEGRAL DISCONNECT SWITCH.
 - PROVIDE GREASE BOX.
 - PROVIDE INSULATED AND VENTED 28" SQUARE ROOF CURB.
 - PROVIDE INSULATED AND VENTED 22" SQUARE ROOF CURB.
 - PROVIDE HINGED ACCESS KIT.

AIR DEVICE SCHEDULE

TAG	MANUFACTURER	MODEL	FACE SIZE	NECK SIZE (IN.)	MAX NC	PATTERN	MOUNTING	SLOT LENGTH	SLOT WIDTH	SLOT QTY	SYSTEM CLASSIFICATION	COMMENTS
A3	TITUS	TMS	24 X 24	6	30	4-WAY	LAY-IN	-	-	-	SUPPLY AIR	1
A4	TITUS	TMS	24 X 24	8	30	4-WAY	LAY-IN	-	-	-	SUPPLY AIR	1
A5	TITUS	TMS	24 X 24	10	30	4-WAY	LAY-IN	<varies>	<varies>	<varies>	SUPPLY AIR	1
A6	TITUS	TMS	24 X 24	12	30	4-WAY	LAY-IN	-	-	-	SUPPLY AIR	1
B3	TITUS	TMS	24 X 24	6	30	4-WAY	FLANGE	-	-	-	SUPPLY AIR	1,2
C8	TITUS	350FL1	24 X 24	18 X 18	30	4-WAY	LAY-IN	-	-	-	RETURN AIR	1
F1	TITUS	50F	12 X 12	6 X 6	30	4-WAY	FLANGE	-	-	-	EXHAUST AIR	2
H10	TITUS	TBDI-80	60 X 7-1/2	12	30	2-WAY	FLANGE	60	1-1/2	3	SUPPLY AIR	3
L1	TITUS	FL-15-JT	SEE PLANS		30	1-WAY	FLANGE	CONTINUOUS	1-1/2	1	SUPPLY AIR	4
P1	TITUS	FBPI	48 X 3-1/2	8	30	-	FLANGE	60	-	-	SUPPLY AIR	3
P3	TITUS	<varies>	<varies>	8	30	<varies>	FLANGE	60	<varies>	<varies>	SUPPLY AIR	3

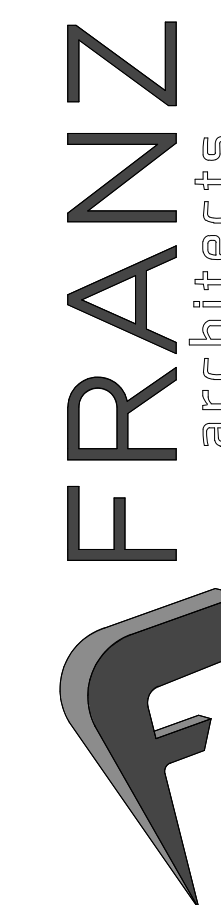
- NOTES:
- PROVIDE BACKPAN INSULATION.
 - PROVIDE PLASTER FRAME FOR MOUNTING IN GYP. CEILING.
 - PROVIDE INSULATED PLENUM.
 - CONTINUOUS LINEAR SLOT DIFFUSER TO BE INSTALLED IN GYP. CEILING. PROVIDE INSULATED SUPPLY AIR PLENUMS AS SCHEDULED FOR A COMPLETE SYSTEM.

KITCHEN HOOD SCHEDULE

Manufacturer	Model	Description	Exhaust Vent Diameter	Exhaust Volume
HAK DALLAS INC.	CUSTOM	8" DOUBLE SIDED GRILL HOOD	1'-0"	1994 CFM
HAK DALLAS INC.	CUSTOM	10 BASKET FRYER HOOD	1'-0"	1216 CFM

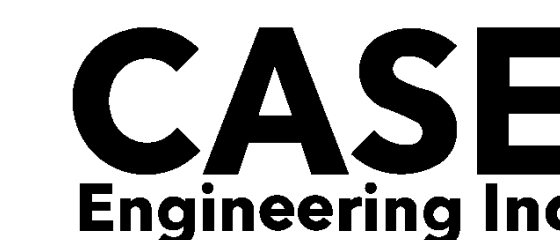
AIR BALANCE AND VENTILATION CALCULATION:

TOTAL OUTSIDE AIR INTAKE = 4010 CFM
 TOTAL GREASE HOOD EXHAUST = 3210 CFM
 TOTAL RESTROOM EXHAUST = 300 CFM
 OUTSIDE AIRFLOW - (GREASE HOOD EXHAUST AIRFLOW + RESTROOM EXHAUST AIRFLOW) = NET POSITIVE AIRFLOW
 4010 CFM - (3210 + 300) = 500 CFM



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 FULSHEAR, TX 77441

Project Number

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Description

MECHANICAL SCHEDULES

Scale

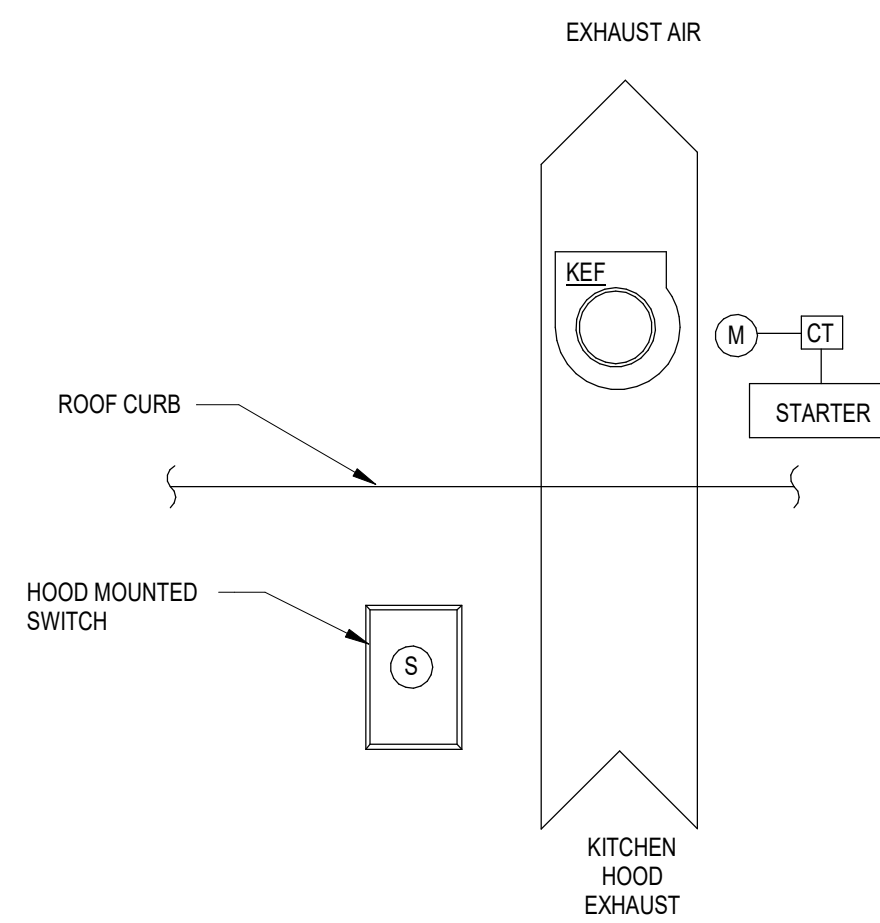
12" = 1'-0"

M6.1

CONTROL SYMBOLS

AE	ANALYZER ELEMENT	CO	CARBON MONOXIDE SENSOR
DDC	DIRECT DIGITAL CONTROL	← - -	COMMUNICATION SIGNAL
BMS	BUILDING MANAGEMENT SYSTEM	HPS	HIGH STATIC PRESSURE SENSOR
RDC	ROOFTOP UNIT DDC CONTROLLER	DA	DAMPER ACTUATOR
FACP	FIRE ALARM CONTROL PANEL	CV	CONTROL VALVE
DPI	DIFFERENTIAL PRESSURE INDICATOR	DX	DX COOLING COIL
DPS	DIFFERENTIAL PRESSURE SWITCH	HC	NATURAL GAS HEATING COIL
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	HGR	HOT GAS REHEAT
EDH	ELECTRIC DUCT HEATER	SF	SUPPLY AIR FAN
EF	EXHAUST FAN		
FE	FLOW ELEMENT		
FLTR	FILTER		
FS	FLOW SWITCH		
H	HUMIDISTAT		
HL	HIGH TEMPERATURE LIMIT SWITCH		
M	MOTOR		
PCV	PRESSURE CONTROL VALVE		
PT	PRESSURE TRANSMITTER		
SMK	SMOKE DETECTOR		
T	TEMPERATURE SENSOR		
TCV	TEMPERATURE CONTROL VALVE		
TSL	LOW LIMIT THERMOSTAT (FREEZESTAT)		
TT	TEMPERATURE TRANSMITTER		
VFD	VARIABLE FREQUENCY DRIVE		
STARTER	MOTOR STARTER (PROVIDE CONTROL RELAY)		
CT	CURRENT TRANSDUCER		
OS	OCCUPANCY SENSOR		

****THE AMBIENT CONDITIONS FOR THIS PROTOTYPE ARE 105/78 °F DB/WB COOLING AND 20 °F DB HEATING. CHECK WITH LOCAL ENGINEER FOR REGIONAL CHANGES IN DESIGN CONDITIONS.****



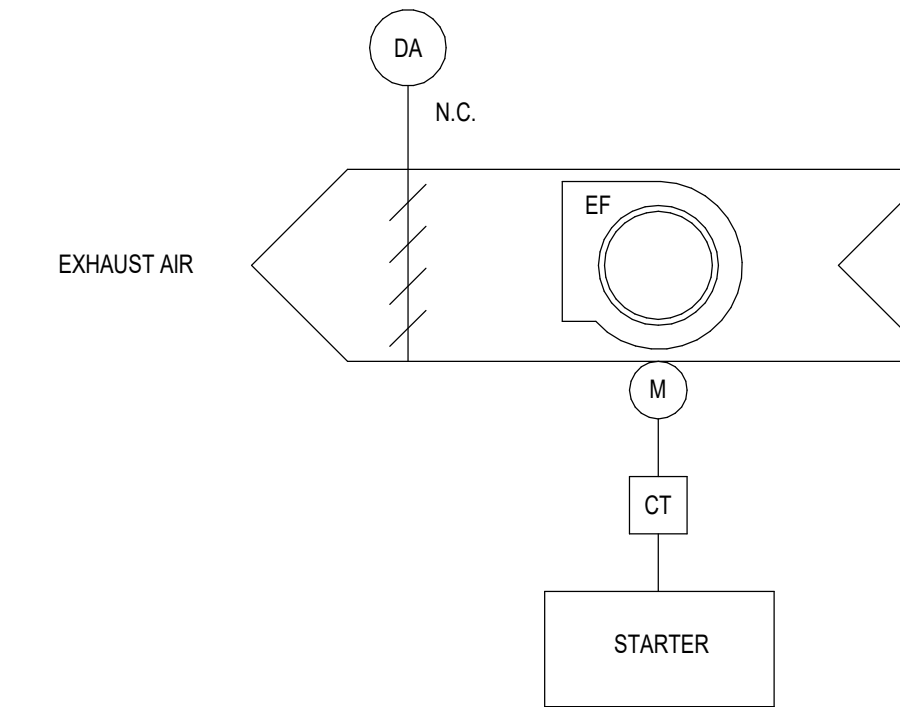
SEQUENCE OF OPERATION

OPERATING CONDITIONS - CONTINUOUS 24/7:
THE KITCHEN HOOD EXHAUST FAN SHALL RUN CONTINUOUSLY WHEN THE KITCHEN HOOD MOUNTED SWITCH IS ON.

INTEGRATED ANSUL FIRE SUPPRESSION SYSTEM:
UPON ACTIVATION OF THE INTEGRATED ANSUL FIRE SUPPRESSION SYSTEM DURING NORMAL KITCHEN OPERATION, THE KITCHEN HOOD EXHAUST FAN SHALL REMAIN ENERGIZED.

FIRE/SMOKE CONTROL:
UPON SENSING DUCT SMOKE, THE KITCHEN EXHAUST FAN SHALL BE CYCLED OFF. FAN STATUS SHALL BE REPORTED TO THE BAS.

C2 KITCHEN HOOD EXHAUST FAN CONTROL DIAGRAM
N.T.S.

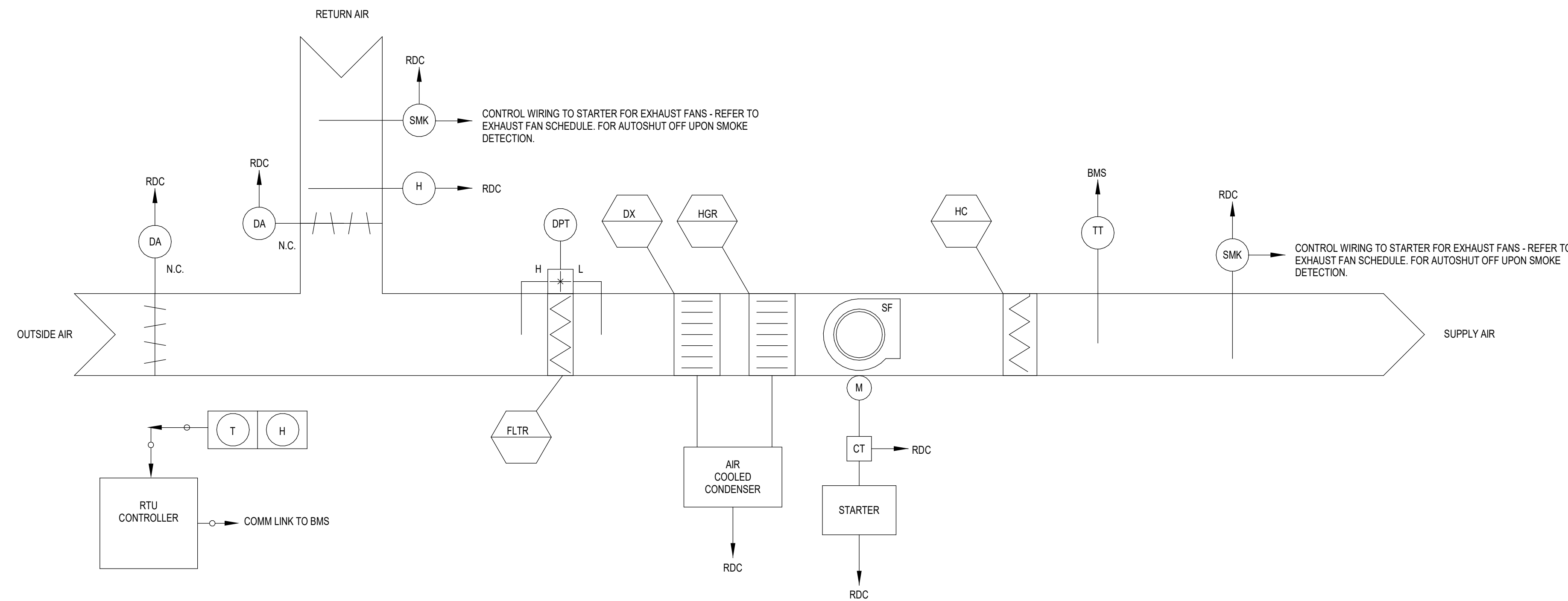


SEQUENCE OF OPERATION

OPERATING CONDITIONS:
THE GENERAL EXHAUST FAN SHALL BE INTERLOCKED WITH THE RESTROOM OCCUPANCY SENSORS. THE EXHAUST FAN SHUTOFF DAMPER SHALL BE INTERLOCKED WITH THE EXHAUST FAN TO OPEN WHEN THE FAN IS ENERGIZED AND CLOSE WHEN THE FAN IS DE-ENERGIZED.

ALARMS:
ALARMS SHALL BE PROVIDED AS FOLLOWS:
1. FAN FAILURE: FAN COMMANDED ON BUT STATUS IS OFF.
2. FAN IN HAND: FAN COMMANDED OFF BUT STATUS IS ON.
3. FAN BELT FAILURE: MOTOR AMPERAGE READS ZERO AS MEASURED BY CURRENT TRANSDUCER.

C3 GENERAL EXHAUST FAN CONTROL DIAGRAM
N.T.S.



SEQUENCE OF OPERATION

OPERATING CONDITION - CONTINUOUS 24/7

THE PILOT LIGHT TO THE RTU CONTROLLER (RDC) SHALL PERFORM ALL CONTROL, SAFETY AND INTERLOCKS AS DESCRIBED IN THE SEQUENCE OF OPERATION. THE BMS SHALL MONITOR THE RTU DDC CONTROLLER VIA BMS PROTOCOL. COMMUNICATION AND/OR COMBINATION OF DISCRETE INPUT/OUTPUT POINTS. THE BMS SHALL OPERATE THE UNIT CONTINUOUS 24/7. WHEN THE UNIT IS DE-ENERGIZED BY THE BMS, THE FAN SHALL SHUT DOWN, THE OA DAMPER SHALL CLOSE. THE REFRIGERATION SYSTEM SHALL ALSO BE DE-ENERGIZED AND THE HEATING SYSTEM LOCKED OUT OF HEATING MODE.

TEMPERATURE CONTROL
OCCUPIED MODE - THE BMS WILL MAINTAIN THE FOLLOWING SPACE TEMPERATURE SETPOINTS:
• COOLING: 75°F (ADJUSTABLE)
• HEATING: 70°F (ADJUSTABLE)

HUMIDITY CONTROL
IF THE RELATIVE HUMIDITY OF THE RETURN AIR EXCEEDS 60% (ADJUSTABLE) AND THERE IS NO CALL FOR COOLING IN THE SPACE, THE RDC SHALL ENABLE DEHUMIDIFICATION MODE OF THE RTU BASED ON ITS OWN INTERNAL CONTROLS UTILIZING HOT GAS REHEAT.

ECONOMIZER OPERATION
BASED ON THE RTU INTERNAL CONTROLS, THE RDC SHALL VARY THE OUTSIDE AIR DAMPER POSITION, BASED ON CALL FOR COOLING IN THE SPACE. THERE SHALL BE ONE FAN SPEED. THE RDC SHALL LOAD AND UNLOAD COMPRESSORS BASED ON THE UNIT INTERNAL CONTROLS TO CONDITION OR DEHUMIDIFY THE SPACE AS NEEDED.

SEQUENCE OF OPERATION [CONTINUED]

THE BMS SHALL BE PROGRAMMED SO THAT THE HEATING AND COOLING SYSTEMS SHALL NEVER OPERATE SIMULTANEOUSLY.

UNIT SHUTDOWN:
UNIT SHALL BE DE-ENERGIZED UPON DETECTION OF SMOKE IN DUCT OR BUILDING FIRE ALARM.

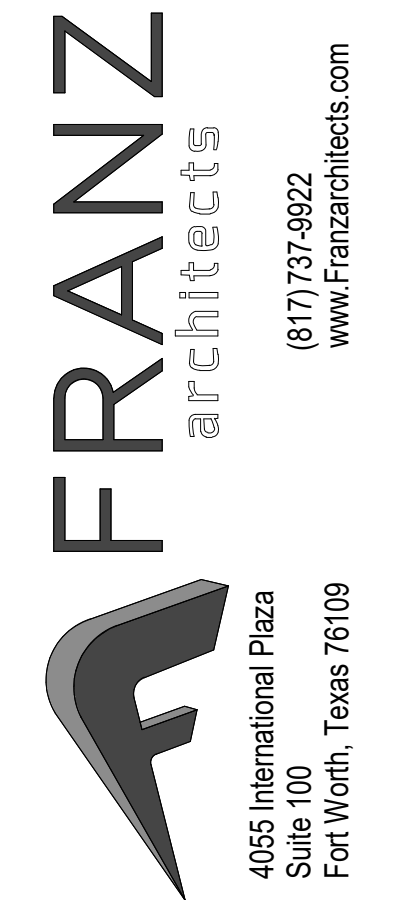
ALARMS
THE BMS SHALL MONITOR ALL SAFETIES ON THE REFRIGERATION SYSTEM AND THE HEATING SYSTEM THROUGH THE RDC COMMUNICATION PROTOCOL. ALL ABNORMAL CONDITIONS SHALL BE ALARMED AT THE BMS.

A. **FILTERS**
THE RDC SHALL MONITOR THE STATIC PRESSURE DROP ACROSS THE FILTER BANK AND ALARM ON HIGH STATIC PRESSURE DROP. A DIFFERENTIAL PRESSURE SWITCH ACROSS THE FILTER SHALL INITIATE FILTER ALARM WHEN THE PRESSURE DROP ACROSS THE FILTER REACHES THE SETPOINT OF 1.0 INCHES W.C. (ADJUSTABLE).

B. **FIRE/SMOKE CONTROL**
UPON ACTIVATION OF A DUCT SMOKE DETECTOR, THE BMS SHALL RECEIVE AN ALARM.

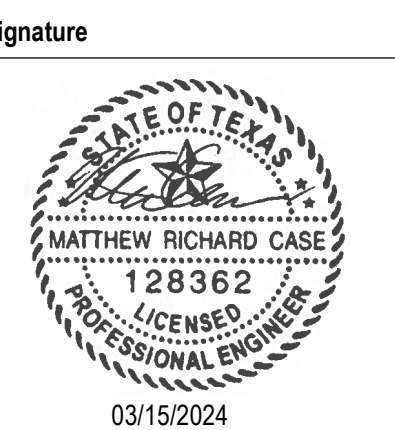
C. **GENERAL ALARM**
ANY TROUBLE ALARM OR FAULT WITHIN THE UNIT ONBOARD CONTROLS WILL GENERATE A GENERAL ALARM TO THE BMS.

A1 PACKAGED ROOFTOP UNIT CONTROLS DIAGRAM
N.T.S.



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Description
MECHANICAL CONTROLS

Scale
As indicated

M7.1